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OBSERVATIONS ON VIRUS PNEUMONIA OF PIGS IN KENYA

BY

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INTRODUCTION

In 1951 the attention of the Research Services was drawn to a disease characterised by frequent and persistent coughing in pigs of all ages, on a large, well-managed farm in the Rongai district of Kenya. Occasionally suckling and weaner pigs died or were very backward but deaths in older animals were infrequent. Another noticeable feature was the slowing down of weight gains with poor food conversion ratios so that animals did not reach bacon weight (220 lb.) until four to six weeks later than usual. According to the owner, the disease, which did not appear to have any relationship to ascariasis, dated from the time of introduction of some new breeding stock.

Post-mortem examinations of coughing pigs showed the presence of a pneumonia in the anterior parts of the lung, from which no consistent bacterial growth could be obtained. Pathologically, the presence of a pneumonitis, with mononuclear cell infiltrations, was suggestive of a viral aetiology. Two attempts to transmit the condition to pigs by intranasal instillation of unfiltered lung suspension were unsuccessful. Two further attempts with lung material showing similar macroscopic changes and originating from two other farms also failed.

In August, 1952, enquiries made at the local bacon factory revealed that the lungs of a considerable proportion of slaughtered pigs were affected with apparently active pneumonia. From the lungs of one animal an infective agent was isolated by intratracheal and intranasal inoculations of healthy pigs. (Strain Rongai I.) Two similar primary isolations have since been made (strains Rongai II and III), the pigs in all three instances originating from the same farm—another large, well-managed property in the same district as that in which the disease was first observed. It is of interest that in this case the owner does not complain of slow weight gains; he affirms that there is very little coughing amongst the pigs and that deaths are extremely rare from any cause. Judging by the grading of his baconers, and apparently financially, he is one of the most successful pig breeders in Kenya, yet at slaughter, 50 per cent. or more of his batches of pigs show pneumonic lesions, sometimes extensive.

Limited field investigations indicate that when first introduced to a farm, this infection may cause serious coughing, "thumps," delayed maturation and even an appreciable number of deaths, particularly in animals up to three or four months of age. After some time, there is a decline in obvious symptoms but the poor weight gains probably continue in a less spectacular fashion. There is some clinical evidence that suckling pigs may acquire a degree of resistance from previously infected dams and following infection develop a mild, clinically inapparent but progressive disease.

It became obvious, immediately after the first successful artificial transmission, that this disease was very similar to, if not identical with, that described by Gulrajani & Beveridge in 1951 as "infectious pneumonia of pigs" and subsequently called by Cambridge workers "virus pneumonia of pigs" (Betts, 1952 and Betts & Beveridge, 1952). They noted the similarity of this condition to one which occurs in Australia and which Pullar (1948) called "infectious pneumonia of pigs."

Examination of bacon pigs at slaughter has shown that this form of pneumonia is extremely widespread throughout the settled area of the Colony. Its existence has previously been largely overlooked or ignored. The only previous record of widespread respiratory disease of pigs in this territory is that of Daubney (1935), who described an epizootic of swine influenza with clinical and aetiological features closely resembling those observed in the U.S.A.

EXPERIMENTAL TRANSMISSION

Primary isolations of a pneumonia-producing agent were made successfully on at least three occasions (Rongai I, II and III). In the case of R.I and R.III no significant bacteria were present in the original pneumonic lung. No bacteriological examination was carried out in the third instance. The first strain only was passaged beyond a first subinoculation and the history is shown diagrammatically in Fig. 1. It is, at the time of writing, in its seventh laboratory passage. The strains R.I, R.II and R.III were in all probability identical, since they were derived from pigs originating on the same farm.

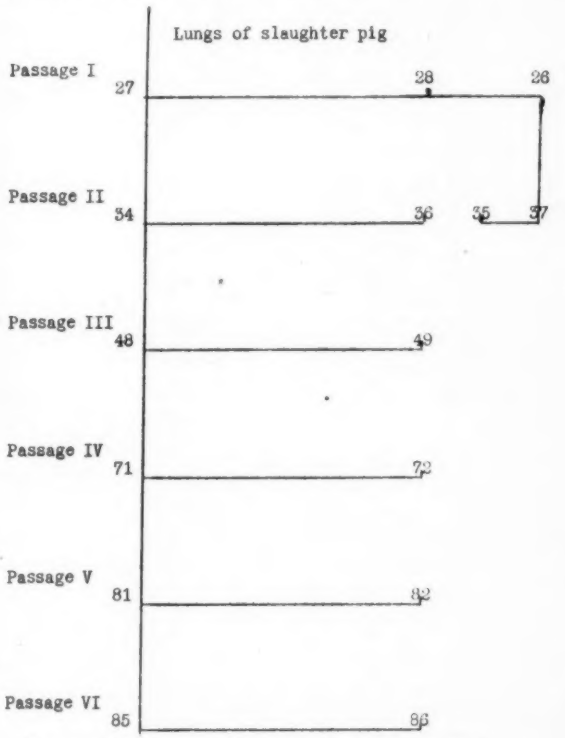

FIG. 1.—Virus pneumonia: passages, strain Rongai I.

The experimental pigs used were purchased from farms considered to be free from respiratory disease; the great majority came from one supplier whose pigs are used at this laboratory for other investigations and have not in these instances shown pneumonic lesions at *post-mortem* examination. It is now fully realised that without close scrutiny of all pigs slaughtered from any one farm, it is impossible to be certain that virus pneumonia is not present. Unfortunately, no completely satisfactory source of experimental animals existed at the time this work was undertaken, but confidence in the reliability of the results obtained was increased (a) by our consistent failure in early instances to produce the disease in pigs of the same origin, (b) by the character in inoculated pigs of the lesions observed—these were always consistent with relatively short-lived infection—and (c) in early passages by the occurrence of fairly regular temperature reactions.

Inoculum

It will be seen from Table I that the great majority of successful transmissions (pneumonia or pleurisy) were made utilising lung or lung and pulmonary lymph gland suspensions. No trials of the comparative infectivity of lung and lymph gland were carried out. The method of preparation was simply to grind the tissues with sand in a mortar, thereafter adding sufficient normal saline to make a 10 to 20 per cent. suspension; this was decanted twice to free it from the larger particles, and then, as a routine, treated with 1,000 or 10,000 I.U. penicillin sodium and 1,000 I.U. streptomycin hydrochloride per ml. The suspensions were stored at ±4°C. pending the inoculation, which was carried out between one hour and three days later, the dose being 4·5 to 10 c.c. depending on the size of the pig.

Incubation Period and Development of the Pneumonia

The shortest interval between the initial rise of temperature and the finding of macroscopic pneumonia at *post-mortem* examination was two days (Pig 71) and the shortest time *post*-inoculation that pneumonia was present was 16 days (two pigs, Nos. 27 and 71). For the accurate determination of an incubation period in this disease reliance must necessarily be placed on a clear-cut temperature rise. Nevertheless, since pigs can develop a pneumonia without any significant fever, it is always possible that the first rise of temperature does not actually coincide with the initiation of a pneumonic or pleuritic process (see, for example, the 16-week-old pig, No. 48, with a particularly prolonged incubation period). As temperatures were seldom taken more than once prior to inoculation, Pullar's (1949) criteria could not be applied, and Table I shows results calculated on the basis (a) of evening temperatures of 104·5°F. or more, ignoring the day of inoculation, and (b) of morning temperatures in excess of 103°F. The temperatures of all pigs were taken twice daily throughout the period of experiment. In general, morning temperatures exceeding 103°F. have been regarded as of greatest importance.

Table I shows data for 10 pigs of the series R.I, successfully infected intranasally or intratracheally by lung or lung-lymph gland suspensions, for which an estimation could be made of incubation periods from the temperature reaction. Figures were obtained of 12 to 19 days or 11 to 26 days depending on whether evening or morning temperatures were accepted as the most reliable guide. With one exception (No. 48) all figures fell between the limits 12 to 15 and 11 to 15 days respectively. Temperature reactions rapidly declined in frequency and extent after the third passage.

Table I

Pig number	Age (approximately), weeks	Material	Passage number	Dose (c.c.) and route	First morning temperature ab. 103° F.	First evening temperature 104·5° F.	Day of slaughter	Pneumonia
26	10	L.	R.I/1	5 i/n.	11	13	17	±
27	10	L.	R.I/1	5 i/t.	13	13	16	±
28	10	L.	R.I/1	3 i/n. ±2 i/t.	14	15	19	±
33	14	L.±G. (F.)	R.I/2	10 i/t.	—	12	47	±
34	14	L.	R.I/2	5 i/t.	13	12	33	±
35	14	L.±G.	R.I/2	5 i/n.	14	14	18	±
36	14	L.	R.I/2	5 i/t.	12	13	18	—(Pl.)
37	14	L.±G.	R.I/2	5 i/t.	13	13	18	—
42	12	L.	R.II/1	5 i/t. ±5 i/n.	14	—	28	—
44	12	L.	R.II/1	5 i/t. ±5 i/n.	—	—	28	±
48	16	L.±G.	R.I/3	10 i/t.	26	19	34	±
49	16	L.±G.	R.I/3	10 i/t.	17	18	20	—
63	8	L. (F.)	R.II/2	7 i/t.	4	10	22	—
67	8	i/c.	See No. 63	—	9	9	19	—
70	10	L.±G.	R.I/4	5 i/t.	—	14	41	±
71	10	L.±G.	R.I/4	5 i/t.	15	14	16	±
72	10	L.±G. (F.)	R.I/4	4 i/t.	—	—	21	—
73	10	i/c.	See No. 72	—	—	—	—	—
74	12	L.±G.	R.III	8 i/n.	—	—	17	—
75	12	L.±G.	R.III	8 i/t.	—	—	25	±
80	10	i/c.	See No. 70	—	—	—	25	±
81	9	L.±G.	R.I/5	4·5 i/t.	—	—	28	±
82	9	L.±G.	R.I/5	4·5 i/t.	—	—	28	±
84	10	L.±G.	R.I/4	5 i/t.	—	3 (2)	23	±
85	10	L.±G.	R.I/6	5 i/t.	—	—	22	±
86	10	L.±G.	R.I/6	5 i/t.	—	—	23	±
87	10	L.±G.	R.I/4	5 i/t.	—	—	22	±

Note.—Strains used are designated R. (Rongai), I, II and III. The number which follows refers to the passage. L. = lung; G. = pulmonary lymph gland; (F.) denotes a filtrate as described in the text. i/c. = in-contact control; i/n. = intranasal; i/t. = intratracheal inoculation; Pl. = pleurisy.

One animal, Pig No. 37, inoculated intranasally with a suspension of proved infectivity, developed a definite temperature reaction after the usual incubation period (13 days), but when killed on the 18th day showed no macroscopic pneumonia (see Fig. 2). The same observation was made following inoculations with blood or plasma intravenously (see Pigs 43 (Fig. 4) and 79); it suggests that infection accompanied by a viraemia is not of necessity followed by pneumonia, at least of a progressive type visible macroscopically.

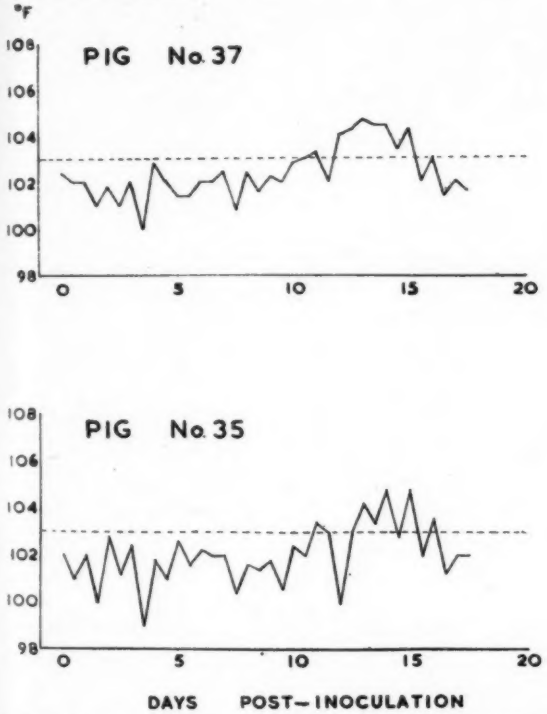

Fig. 2.—These two curves show how almost identical temperature reactions can follow in two pigs inoculated on the same day with the same material. Whilst, however, No. 35 showed a pneumonia of the right apical lobe at *post-mortem* examination, no macroscopic abnormalities were seen in No. 37. (Passage RI/2.)

Infectivity of Blood

Several trials were made of the infectivity of blood, the results being tabulated below (Table II). It can be seen that a pneumonia and pleurisy were each produced on one occasion. Intravenous inoculations were made by the vena caval route, care being taken that blood issued freely

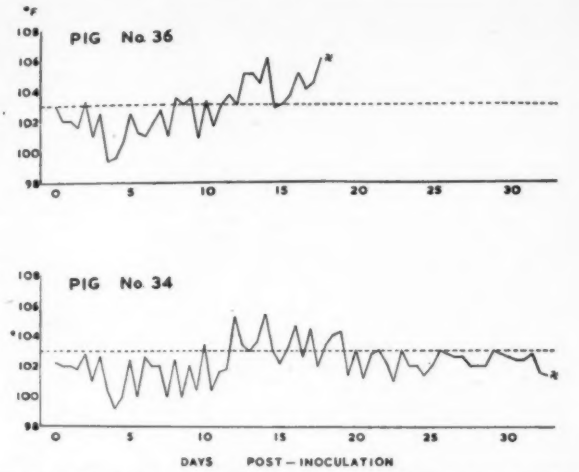

Fig. 3.—The top curve (No. 36) shows a severe temperature reaction associated with the development of a pleurisy and pericarditis. No. 34 was inoculated on the same day with the same material and showed mild pyrexia of about one week's duration. On slaughter it showed pneumonia. (Passage RI/2.)

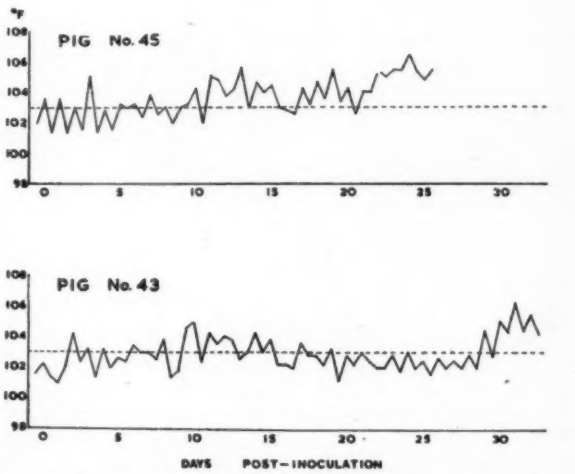

Fig. 4.—Pig 45 was given 15 c.c. intravenously of plasma from No. 36 on the 13th day following its inoculation. Note the primary reaction on the 12th day and the delayed secondary rise. Pleurisy was present at *post-mortem* examination. Pig 43 received 15 c.c. plasma intravenously from No. 37 on the 13th day following its inoculation. Note the distinct primary and secondary reaction. No macroscopic lesions were found at slaughter. (Passage RI/3.)

Table II

Pig number	Age, weeks	Inoculum	Passage number	Dose (c.c.) and route	First evening temperature 104·5° F.	First morning temperature ab. 103° F.	Day of slaughter	*Post-mortem* findings
43	10	Plasma	R.I/3	15 i/v.	10	10	33	—
45	10	"	R.I/3	15 i/v.	11	10	26	Pleurisy
46	10	Serum	R.I/3	5 i/n.	19	19	27	—
47	10	"	R.I/3	5 i/n.	11	9	34	Pneumonia
78	10	"	R.I/5	20 i/v.	—	—	25	—
79	10	Citrated blood	R.I/5	30 i/v.	4	6	25	—
73	10	" "	R.I/6	15 i/v.	—	—	24	—

Note.—i/v. = intravenous ; i/n. = intranasal.

from the needle before attaching the syringe, so that there was no possibility of the inoculum being deposited in the pleural cavity.

Animals Nos. 43 and 47 were inoculated with material from the same pig, No. 37, which was bled on the first day of temperature rise (13) and showed no macroscopic lesions when killed on the 18th day.

Nos. 45 and 46 were subinoculated from Pig No. 36 on the second day of reaction (13) this animal subsequently developing pleurisy, found at death on day 18. Unfortunately, due to lack of adequate housing facilities all the above four inoculated pigs were housed together.

In the case of animals Nos. 43, 45 and 47 there was a definite diphasic temperature reaction, the second rise of temperature beginning 31, 22 and 33 days respectively after inoculation (Fig. 4). The initial reaction at about the 10th day was of relatively slight degree and, in No. 43, clearly demarcated from the secondary rise. The reaction in No. 46 and the secondary reactions of the other three were more marked.

Pigs Nos. 78 and 79 were given inocula from Pig 2770 on the 16th day following its inoculation when its temperature was 103°F. in the morning. A well-marked pyrexia was caused in Pig 79 (maximum 105°F. on the fourth day) but without any subsequent pneumonia. Blood from this animal was taken on the fourth day and subinoculated without result into Pig No. 73.

Filtrates

Three attempts were made to set up the disease using filtrates. Pig No. 33, 12 weeks old, received 10 ml. intratracheally of a Ford "Sterimat S.B." filtrate from a lung-lymph gland suspension of Pig 2726. The suspension was bacteriologically sterile and was shown to have been infective before filtration by inoculation into Pigs Nos. 35 and 37. The single rise of temperature recorded on the 12th day in Pig 33 was possibly of no significance, but pneumonia was present on *post-mortem* examination at day 47.

Pig 63 (seven to eight weeks old) received 7 ml. intratracheally of a filtrate from a lung suspension of No. 44 (strain R.11). These lungs had been stored at ±4°C. for eight days and the filtrate was made by passing the supernatant of a suspension (approximately 10 per cent.) through an S1 pad (Republic-Seitz Fitter Corp., Newark, N.J.). There was an indefinite temperature reaction and no pneumonia on slaughter at day 22; an in-contact control pig, No. 67, showed a definite temperature reaction beginning on day 17 of the experiment. On day 19 it was lying huddled in the straw and was destroyed. There were no gross *post-mortem* lesions.

Pig 72, a 10-week-old piglet, was given 4 ml. intratracheally of a Ford "Sterimat S.B." filtrate of lung-gland suspension from Pig 2748. The suspension was bacteriologically sterile and proved infective by inoculation of Pigs Nos. 70 and 71. Another animal, No. 73, was placed in contact with No. 72 until the latter was killed on the 21st day. There was no temperature reaction in either pig; no pneumonia was found in No. 72 and No. 73 was transferred to another experiment; it proved subsequently (day 45) to have no pneumonia.

The failure to transmit the disease by pad filtrates is perhaps not surprising in view of the probable large size of the virus particles (according to Betts (1952) and Betts & Beveridge (1952) at least 200 mμ).

Route of Inoculation

Apart from the intravenous inoculation of blood, serum or plasma, only the intranasal and intratracheal routes were employed. In the three instances where a direct comparison was possible (Nos. 26 and 27, 35 and 37, 74 and 75) two successful infections followed each method of inoculation.

However, four lots of field material were inoculated on a single occasion intranasally, with or without light ether anaesthesia; all were derived from apparently similar pneumonic lungs. A total of 10 pigs was involved, seven being killed after five, eight, nine, 14 (2), 26 and 78 days respectively. None showed any pneumonia or pleurisy. The three remaining pigs were susceptible to reinoculation intratracheally 21 days later.

The intratracheal route, therefore, is possibly the most reliable method of reproducing the pneumonia.

Contact Infection

Pig No. 80 was placed in the same sty as infected Pig No. 70, which had been inoculated intratracheally 16 days previously and shown a slight temperature reaction. Both were killed on the 25th day following and each showed a pneumonia, which in No. 80 was limited to the right apical lobe. There was no definite temperature reaction in this latter so that the incubation period could not be determined.

Age of Pig

Pigs of all ages between eight and 16 weeks were successfully infected (Table I) but there are not enough data to make deductions about variation of susceptibility with age.

Viability

Fresh lungs kept in the cold room of an abattoir for seven days and a further 24 hours in a refrigerator at 0 to 4°C. were still infective (Pig 44). Lung suspensions treated with antibiotics and maintained at ±4°C. were viable after three days (Pigs 34 and 35). Lung-gland suspensions treated in a similar manner were also infective after three days (Pigs 81 and 82).

Four pigs inoculated intranasally or intratracheally with lung tissue from Pig 28, which had been stored in 50 per cent. glycerine at 0 to 4°C. for 46 days, all failed to become infected in 21 to 32 days. Untreated lung tissue from Pig 2748, stored for 47 days at deep-freeze temperatures, produced pneumonia when inoculated in two pigs (Nos. 84 and 87) after 23 and 22 days respectively.

Attempted Transmission to Laboratory Animals

On three occasions young weaned mice (24, 12, 12) were inoculated intranasally with lung suspensions treated with antibiotics; a subinoculation in one case was carried out on the ninth day. The infectivity of these suspensions for pigs was proved in two instances, but no pneumonia was produced in the mice. Attempts to infect unweaned (8 to 10 days old) mice were made on two occasions with lung-lymph gland suspensions, treated with antibiotics and of proved infectivity for pigs. The routes of inoculation employed were the intraperitoneal and intracerebral. No definite evidence of establishment of the infective agent was obtained.

Various attempts to establish the agent in fertile eggs, using different methods of inoculation and different temperatures of incubation, were also made but without success.

Pathology

(a) *Distribution of the Pneumonia.*—Of 19 experimental cases of maximum duration four to five weeks, all but one

showed lesions of the right apical lobe, the figures for the other lobes being: left apical 14, right cardiac 14, left cardiac 12, right diaphragmatic 11, left diaphragmatic 10, intermediate lobe 9. From a study of the distribution in cases of varying duration, it was evident that the pneumonia began in the apical and cardiac lobes, especially the right apical, and spread via the bronchial tree from the hilus of the lung. All lobes could be involved as early as the 25th day following intratracheal inoculation. The oldest lesions were usually towards the tip of the apical or cardiac lobes, *i.e.*, the most dependant parts. Lesions of the diaphragmatic lobes were generally limited to the anterior third but occasionally scattered foci were found posteriorly, especially on the diaphragmatic surface.

(b) *Macroscopic Appearances.*—The description of older lesions here is based on an examination of lungs from the bacon factory. Early lesions were seen to be irregular greyish infiltrations of whole lobules or parts of lobules, particularly subpleurally. The extension and confluence of these foci gave rise to areas of complete consolidation which were of a greyish-pink or purplish colour; the colour appeared to get darker in older lesions. Initially, the consolidated areas were at the same level as the normal surrounding tissue, which sometimes showed a degree of alveolar emphysema, or alternatively slightly raised and more voluminous; as has been remarked by Betts (1952), they resembled lymphoid tissue. In lungs from bacon pigs, the pneumonic parts of the anterior lobes, especially inferiorly, were often shrunken, the contracted part being clearly demarcated from adjacent normal or early pneumonic tissue. In some cases the pleura overlying these areas showed tortuous and dilated blood vessels.

In the anterior lobes there was a distinct tendency for the production of narrow transverse pneumonic streaks, which by fibrosis and contraction caused great irregularity in the shape of the lobe.

On incision, the pneumonic tissue was firm, not friable; if of long standing there was often definite production of fibrous streaks. On compression, a blood-stained oedematous fluid escaped and viscid mucoid droplets exuded from the bronchioles. These droplets were also often blood-stained, never yellowish and sometimes almost clear; they could be expressed even from areas of shrinkage and fibrosis.

The pulmonary lymph glands, especially those draining pneumonic areas, usually showed varying degrees of enlargement and oedema. In natural cases, the glands were often greatly hypertrophied with considerable congestion and frequent haemorrhage, especially in the cortex. On incision such glands exuded much blood-stained fluid and were very friable.

(c) *Bacteriology.*—Impression smears of pneumonic lung stained by Giemsa's method usually failed to reveal any organisms and, incidentally, never inclusion or elementary bodies. The same applied to Giemsa-stained sections of Zenker-formol-fixed material. In 18 experimental cases, cultures were prepared from one or more areas of pneumonic lung on blood agar plates and in 14 of these chocolate agar plates were also inoculated. A significant growth occurred in only one instance (Pig 81) when a gram-positive diplococcus was recovered. Incubation was carried out aerobically, usually for at least two days. Hence, the great majority of infected lungs were sterile, at least as far as the commonly culturable or visible bacteria are concerned.

(d) *Histopathology.*—This was studied (a) by impression smears of pneumonic lung, and (b) by sections. The results of both examinations pointed to the same conclusions and it is intended later to publish a more detailed account of the changes observed.

The inflammatory process appeared to begin around bronchioles as a thickening of the walls of alveolar sacs and alveoli. The thickening was due to a swelling and proliferation of the cells which resulted in the production of large polygonal elements. These remained attached to the alveolar walls (septal cells) or became rounded free macrophages within the alveoli. They were often highly vacuolated, especially when remaining attached. Mononuclear cells of various types—medium and large lymphocytes, plasma cells—then appeared in varying numbers both free and, to a lesser degree, within the capillaries and tissues of the alveolar walls.

There was often an exudate within the alveoli during the early phases, this appearing in material fixed by Zenker-formol as eosinophilic granules. Red cells could also be found in small numbers, and some areas showed considerable numbers of polymorphs, the occurrence of which did not depend on secondary bacterial infection. Bronchitis, if present, was mild in degree and obviously secondary. There was a marked hyperplasia of the peribronchial lymphoid tissue.

(e) *Serositis.*—In natural cases a serofibrinous pleurisy with production of adhesions between the pneumonic lobes and between the visceral and parietal pleura was not unusual. Similarly, a serofibrinous pericarditis, with adhesions, could accompany the pneumonia, or all three lesions coexisted.

A unilateral fibrinous pleurisy, with little fluid exudation, was produced in two pigs (Nos. 36 and 45) by the intratracheal inoculation of lung and the intravenous injection of plasma respectively. No. 36 also nad an early serofibrinous pericarditis, but neither pig showed pneumonia macroscopically. No bacteria to be regarded as of significance were cultured from these cases and the lesions appeared to be due to localisation of the infective agent on the serosae. Similar instances were reported by Gulrajani & Beveridge (1951).

Pig No. 49 showed a rapid rise of temperature commencing on the 17th day, attaining 106·2°F. on the evening of the 19th day following intratracheal inoculation. On the morning of the 20th day the temperature was 100°F. and the animal was lying in a position of sternal recumbency, with hind legs splayed, heaving of the flanks and rapid shallow respiratory movements. It was killed and showed no pneumonia or pleurisy. There was, however, a diffuse congestion of the small intestinal mucosa and a peculiar clear gelatinous infiltration of the subserous tissues of the whole of the large intestine with congestion and slight roughening of the peritoneum. Cultures from the spleen, heart blood and pericardium of this animal remained sterile. Pig 2748, inoculated on the same day with the same material, developed an irregular temperature reaction commencing on the 19th day and pneumonia was present on day 34.

These observations, admittedly scanty, may indicate that the virus can localise in the peritoneum as well as in the pleura and pericardium.

Summary

1. The occurrence is recorded in Kenya of a pneumonia of swine which is probably identical with that described by Gulrajani & Beveridge (1951) as " infectious pneumonia of pigs."

2. At least three primary isolations of an infective agent were made by intratracheal inoculations of healthy pigs. One strain was passaged six times.

(*Concluded at foot of col. 1, page 318.*)

THE STABILITY OF VITAMIN A IN ANIMAL FEEDING-STUFFS

BY

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It has been clear from the early work of Marcus (1931) and others that the vitamin A present in fish-liver oils may be destroyed rapidly following admixture with compound feeding-stuffs. Temperton & Dudley (1947) recorded losses of up to 100 per cent. of the added vitamin A within 24 hours of mixing, and concluded that the preformed vitamin in fish-liver oil was an unreliable source when included in mash mixtures for adult fowls and growing chickens. Moisture, light, contact with minerals (especially manganese), rancidity and any other factors favouring oxidation are detrimental, while the presence of antioxidants may decrease the rate of loss. Not all the results have been obtained from studies on cod-liver oil (C.L.O.), but there has been considerable adverse criticism of the practice of adding this substance to compound feeding-stuffs, and since the introduction of the Feeding Stuffs (Manufacture) Order, 1952, some compounders have availed themselves of the opportunity to add " vitamin potent substances " in place of C.L.O. It should, however, be added that the manufacturers of C.L.O. advocate its direct use on the farm, and stress its nutritional properties other than those relating to the supply of vitamins A and D. In this connection, we are interested in ascertaining the extent to which the beneficial effects of cod-liver oil in accelerating recovery from avian coccidiosis (Murphy, Hunter & Knandel, 1937) are connected with the lowered vitamin A reserves one of us has recently established in the disease (Davies, 1952).

During the past six years we have conducted a considerable number of storage tests on carotene and vitamin A in foodstuffs. The results of these trials are being published in detail elsewhere, but it is felt that the following brief summary of certain of the findings may be of veterinary interest :—

(1) In the case of vitamin A added in the form of C.L.O., stability is greater in a mash of medium particulate size (" moderately fine ") than in one of coarse particulate size (see B.P.C., 1949, pp. 1265-1266). This is true over a wide range of light and temperature conditions, and in containers of different types, with corresponding variations in the degree of exposure to atmospheric oxidation.

(2) Cubing of the diet materially assists the stability of both vitamin A and carotene. After storage for 100 days at room temperature the percentage of vitamin A (added as the palmitate) and of carotene (in dried grass) in the case of a standard formulation we have employed are of the order of 66 and 80 respectively when the material has been cubed, but of the order of only 20 and 60 respectively when it has been left in meal form.

(3) The stability of vitamin A palmitate in typical compound meals examined by us appears on the whole to be greater than that of the vitamin A of C.L.O. in similar storage conditions. It is clear, however, that many factors may modify the stability of " synthetic " vitamin A, and that the preparation of a suitable pre-mix is of the greatest importance, otherwise destruction may be rapid and complete.

(4) The stability of the carotene of dried grass added to compound meals has proved excellent over a wide variety of storage conditions.

(5) The protective action of gelatine on the vitamin A of C.L.O. exposed to a mineral mixture has been amply confirmed (see Halverson & Hart, 1950). Such findings, together with those of Burns & Quackenbush (1951) on sealing vitamin A into a carrier by means of a microcrystalline wax, encourage the search for effective stabilising methods that could be employed on a commercial scale in feeding-stuffs. In the case of pharmaceutical preparations, recent work from the Glaxo Laboratories (Coles & Thomas, 1952) has indicated that vitamin A may be stabilised with the aid of " Lubrol W " I.C.I. (containing polyoxyethylene cetyl-stearyl alcohol), while we have recently examined a cod-liver oil emulsion (" Olyocream," Walter Gregory & Co.) that had been subjected to a shelf storage test lasting exactly 10 years and found the vitamin A content to be at almost 60 per cent. of its original level.

(6) The effect of the other constituents of the diet on the stability of vitamin A is very considerable, and chance admixture may influence the rate of destruction markedly. Thus the stability of the vitamin A in C.L.O. is greater in the presence of fish meal or liver meal, but less in the presence of dried brewer's yeast, than it is in the presence of cereal products such as wheatings, barley meal or ground oats.

The problem of the rapid destruction of substances incorporated in small quantities in animal feeding-stuffs is not, of course, peculiar to vitamin A. In some of the feeding trials with antibiotic supplements conducted from this laboratory we have found that differences between one preparation and another are attributable to the fact that, as determined on check assay, the active ingredient has disappeared in the one case but remained at a significant concentration in the other. It is not inconceivable that some of the " negative " results with antibiotics obtained elsewhere have in fact been due to destruction of the active ingredient before the material was consumed.

This work has been conducted in part in the Department of Animal Health, University College of Wales, and in part at the Animal Health Trust, Houghton Grange, and one of us (A. W. D.) is grateful to Nutrex, Ltd., for permission to continue it in this laboratory.

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3. Lung and lymph gland filtrates, prepared by using filter pads of the Seitz type, were shown to be infective in only one of three instances.

4. Observations were made on the experimental disease with particular reference to the frequency of temperature reactions and the demonstration of a viraemia.

5. The gross and microscopic pathology are briefly described.

6. No success attended preliminary efforts to establish the agent in mice and embryonated eggs.

Acknowledgments.—It is a pleasure to express my thanks to Dr. S. E. Piercy for his interest and advice during the course of these investigations and also for carrying out the work on attempted transmission to the embryonated egg.

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REFERENCES

BETTS, A. O. (1952). *Vet. Rec.* **64.** 283.
——— & BEVERIDGE, W. I. B. (1952). *J. Path. Bact.* **64.** 247.
DAUBNEY, R. (1935). Ann. Rept. Dept. of Agric., Kenya Colony (1935). Vol. II. 144.
GULRAJANI, T. S., & BEVERIDGE, W. I. B. (1951). *J. comp. Path.* **61.** 118.
PULLAR, E. M. (1948). *Austral. vet. J.* **24.** 320.
———. (1949). *Brit. vet. J.* **105.** 437.

CLINICAL COMMUNICATION

A CASE OF ACUTE RAGWORT POISONING IN THE HORSE

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AND
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The occurrence in the horse of primary liver damage of toxic origin, associated with disorders of the central nervous system, has been recorded in a number of countries. In some cases the liver lesions take the form of an acute hepatitis ; in others cirrhosis is the prominent lesion and the disease is protracted after a considerable latent period.

The liver and brain disturbances which occur in such diseases apparently constitute a syndrome more characteristic of the horse than of any particular plant toxin, so that in considering the aetiology the evidence of access to a particular plant is of first importance.

Plants of the genus Senecio (ragworts and groundsels) are the most commonly concerned, especially the European species *S. jacoboea* and *S. vulgaris*. The marsh ragwort (*S. aquaticus*) has also been proved poisonous and may be the cause of seneciosis in horses (Evans & Evans, 1949). Liver damage with nervous involvement, recorded as being due to various species of ragwort ingested on the pasture or in hay, has occurred in Great Britain, New Zealand, South Africa and North America.

Stenius (1941) refers to the poisoning of horses by red clover in the Leningrad district and describes a similar disease which occurs particularly in horses grazing on the red clover pastures in Finland. He mentions a form of primary toxic cirrhosis known as Schweinsburg disease, which occurs in horses grazing the marshy pastures related to the tributaries of the Danube. Robin (1945) also draws attention to the many reports of the liver-brain syndrome in the horse in Eastern Europe. He considers that the "stomach staggers" of North America, "bottom disease" of the rich valley bottoms of Missouri, "walking disease" of the Washington area, "Picton cattle disease" of Canada, "malziekte" of South Africa and "Winton disease" of New Zealand are analogous conditions and related to the old Schweinsburg disease of Europe.

The causal agents which have been suspected include Senecio species, *Trifolium hybridum* (Alsike clover) fermented meal, the toxins of Anaplocephala, Trichonema and Strongyle species, a fungoid plant parasite which causes black clover, vetches, lucerne, mouldy hay, lupins and various weeds. In Missouri, *Crotalaria sagitalis* is held responsible. "Kimberley horse disease" in Western Australia is known to be caused by prolonged feeding on a small shrub *Atalaya hemiglauca* (Whitewood) in which the toxic factor is a saponin (Steel, 1949).

References

Burns, M. J., & Quackenbush, F. W. (1951). *Industr. Eng. Chem.* (July), p. 1592.
Coles, C. L. J., & Thomas, D. F. W. (1952). *J. Pharm. Pharmacol.* **4**. 898.
Davies, A. W. (1952). *Nature, Lond.* **170**. 849.
Halverson, A. W., & Hart, E. B. (1950). *J. Nutrition.* **40**. 415.
Marcus, J. K. (1931). *J. biol. Chem.* **90**. 507.
Murphy, R. R., Hunter, J. E., & Knandel, H. C. (1937). *Poultry Sci.* **17**. 377.
Temperton, H., & Dudley, F. J. (1947). *Harper Adams Utility Poultry J.* **32**. 83.

In all these diseases liver damage is found associated with signs of central nervous system derangement, evidenced by inco-ordination, stupidity or frenzy. Dilation of the pupil and blindness commonly occur and usually the pulse rate is greatly increased.

Cases of suspected ragwort poisoning in horses have been seen fairly commonly by one of us in the course of practice in Norfolk. The chronic form of the disease is characterised by periods of dullness with yawning, a staggering gait and a fatal termination. Such cases have not shown jaundice but *post-mortem* examination has revealed degenerative changes in the liver, which in one case was indurated. The cases of the acute disease which have been encountered have shown great nervous excitement with violence as the main clinical sign ; icterus has not been recognised.

Case Report

Subject.—A 15-year-old Suffolk mare.

History.—Throughout the summer the mare had been turned on to a meadow with other horses each evening following a day's work. She was in good condition. On the morning of the visit she had shown signs of blindness when brought in, had excited the other horses by blundering into the wrong stall, bumping door posts, etc. There was no previous history of plant poisoning on the farm.

Clinical examination.—16.8.52. The mare showed inappetence and constipation. She was standing with her head in a corner of the loose-box in which she had been isolated and was restless, occasionally staggering and crossing the forelimbs. She snickered repeatedly and the ears twitched. The visual acuity appeared poor, the pupil was dilated and its light reflex absent. The pulse rate was 60 per minute. The breath had a remarkably offensive odour and a thick white catarrhal deposit covered the tongue. The temperature was normal.

Treatment.—A 6-dram aloes ball was given and 2 c.c. Carbachol were injected subcutaneously.

17.8.52. The symptoms shown were inappetence, excessive thirst, constipation and dysphagia ; the mare was found standing with a mouthful of fodder. The pulse rate was 70 per minute and the extremities were cold but the pupil had returned to normal. Inco-ordination was still shown and the muzzle was abraded. The buccal mucosa was pigmented brown and the conjunctivae were discoloured. Yellowish pigmentation of the sclera was noted.

Treatment.—4 oz. glucose in 1 pint of sterile saline was administered intravenously and 2 c.c. Carbachol were injected subcutaneously. A diet of flaked maize was advised.

18.8.52. The patient appeared brighter and a few balls of mucus-covered dung had been passed. Staggering was still evident but some food had been taken. The sclera were bright yellow in colour. The pulse rate was 68 per minute and the extremities were cold.

Treatment.—As on previous day.

19.8.52. The mare's condition had deteriorated ; she appeared sluggish and depressed, the yellow pigmentation had intensified and the muzzle was swollen and oedematous. Inappetence and polydipsia were still shown. The good bodily condition had been maintained. Soft dung had been passed. Pulse rate, 80 per minute.

Treatment.—4 oz. glucose dissolved in saline was injected intravenously.

20.8.52. The mare was reported down in her box and further treatment was not advised.

Post-mortem Examination (20.8.52.)—The carcase showed generalised severe jaundice. There were localised areas of inflammation in the glandular part of the stomach and in the small intestine. The mucosa of the caecum and the whole

of the large colon was thickened with a gelatinous oedema and showed severe inflammation. Similar but less intense changes involved the small colon as far as the rectum. The liver was uniformly pale but showed no focal lesions or enlargement. The spleen was slightly enlarged. The heart and other organs were examined but the only pathological change in evidence was icterus. The brain was not examined.

Histopathology.—Representative portions of the liver and kidney were embedded in paraffin wax and sections were stained with haematoxylin and eosin, with Van Gieson's stain, and examined for the presence of iron by the Prussian blue method.

Liver.—There were widespread degeneration of the hepatic cells, diffuse infiltration with inflammatory cells, and proliferative changes in the connective tissues and bile ducts.

The hepatic cells showed marked changes especially towards the centre of the lobules. Here the cells were distended by large vacuoles which displaced the nuclei to the cell margins. Towards the periphery of the lobules the cells were less distorted and contained one or more smaller vacuoles which did not displace the nuclei. In the few cells which were free from vacuoles the cytoplasm was granular and pale pink in colour. The vacuolation of the hepatic cells was typical of that seen in fatty change.

Considerable displacement of the hepatic cells was evident, the sinusoids were dilated and the central lobular vein was irregular in outline.

In relation to the sinusoids, there was an intracellular deposition of a brown refractile pigment which was probably retained bile pigment, since the majority of the granules gave a negative reaction for iron. Along the track of the bile ducts and in some cases extending into the periphery of the lobules were columns of proliferating cells resembling bile duct epithelium ; many of them were arranged in duct formation.

Fibroblasts were numerous in the perilobular connective tissue and here evidence of active collagen formation was seen. Fibroblasts were also present to a lesser extent between the hepatic cells, especially in relation to the columns of proliferating cells mentioned above.

Round-cell infiltration into the hepatic tissue was present irregularly throughout. Many of these infiltrating cells were polymorphonuclear ; the remainder were mononuclear cells of the small lymphocyte type.

Kidney.—The cells of the convoluted tubules contained large vacuoles resembling those seen in fatty change. Small foci of infiltrating round cells were present in the interstitial tissue opposed to a few of the glomeruli and arterioles.

Discussion

A diagnosis of plant poisoning was made on the first visit to the case. On the second visit (17.8.52) the farmer produced some roots of freshly eaten-down ragwort plants which he had taken from the field in question, and this circumstantial evidence was considered to be strongly supported by the clinical signs in suggesting a diagnosis of acute hepatitis and brain damage due to ragwort poisoning.

In an article by Craig, Kearney & Timoney (1930), the last-mentioned records in detail the clinical and pathological findings in a series of cases of cirrhosis of the liver in both the chronic and acute forms, in the horse. He found the incidence of the disease, particularly the acute form, to be the highest in seasons of low rainfall and to reach a peak in July and August, when most farm horses are at grass and the herbage is least succulent.

The occurrence of the case under discussion was preceded by a period of drought, and there had been but little grass on the pastures for some weeks.

His clinical descriptions of the acute form of the disease correspond very closely with the symptoms seen in this case and the histopathological findings on examination of liver sections from his cases were similar to those encountered in this case. He was unable definitely to incriminate ragwort poisoning but after analysing all the available evidence, he concluded that this was the most likely cause.

Gilruth (1902), in a detailed report on all aspects of Winton disease in New Zealand, demonstrates that the disease is due to ragwort poisoning. His report includes the results of feeding experiments in cattle, sheep and horses, but in the horse he records only a chronic form of the disease so that his findings cannot satisfactorily be compared with the lesions described in this case.

Acknowledgments.—We wish to thank two members of the staff of the Royal Veterinary College who helped in the preparation of this report. Mr. E. Cotchin, M.R.C.V.S., very kindly prepared the histological sections and criticised the paper, as did Mr. P. L. K. Ingram, B.Sc., M.R.C.V.S., who also gave great help in the interpretation of the sections.

References

Craig, J. F., Kearney, W., & Timoney, J. F. (1930). *Vet. Rec.* **10.** 159.
Edwards, C. M. (1949). *Ibid.* **61.** 864.
Evans, W. C., & Evans, E. T. R. (1949). *Nature, Lond.* **164** 30.
Gilruth, J. A. (1902-3). Report. New Zealand Department of Agriculture. Division of Veterinary Science.
Robin, V. (1945). *Rec. Méd. vét.* **121.** 33.
Stenius, P. I. (1941). *Skand. VetTidskr.* **31.** 193.
Steel, D. J. (1949). *Proc. roy. Soc. Med.* **42.** 205.

ABSTRACTS

I.—The Production and Distribution of Milk*

Following upon the presidential address given by Sir Thomas Dalling, couched in general terms relating more particularly to diseases of animals communicable to man, Professor Burrow presented a provocative paper, relating to possible future developments in the production and distribution of milk. His paper is divided into sections dealing with the premises, the cow, the milker, the utensils, transport and powdered milk. The permanent cow byre comes in for considerable criticism and is compared unfavourably with what might be called outdoor methods of milking. The former, referred to as "a cow's bedroom," is not regarded as a hygienically suitable place in which to milk. The author draws attention to the fact that the cow is likely to be responsible for the transmission of relatively few diseases to human beings and refers in particular to tuberculosis and "Q" fever. Criticisms are levelled at the Attested Herd Scheme, suggesting that clean herds might be more susceptible to subsequent infection, and with regard to the non-attested herds attention is drawn to the infrequency of clinical inspections. Burrow points out, nevertheless, that only about half of the cases of tuberculosis of the udder are likely to be detected by clinical examination alone, and makes a plea for the more general use of the biological test as an adjunct to clinical inspection. He

* **Proceedings of Section D (Veterinary Hygiene), Royal Sanitary Institute Congress, Margate, 1952. I.—The Production and Distribution of Milk : Possibilities for the Future.** Burrow, H. ; **II.—The Hygienic Preparation of Meat Carcases.** Bywater, H. E. (1952). *J. roy. San. Inst.* **72.** 365-387.

considers that a more extensive use might be made of vaccination in the control of tuberculosis, and thinks that such a policy might be incorporated in the Attested Herd Scheme.

More attention should be paid to the medical inspection of dairy personnel and the health authorities might include inspection of those handling milk and other items of human food.

After pointing out that milk contains 85 per cent. water, Burrow goes on to refer to the complexities of the transport system involved in conveying many millions of gallons of milk from the producer to the factory, etc. If milk could be powdered on the farm an enormous saving in money, lorries, personnel, etc., would be made. The paper then goes on to describe in detail certain features arising out of this suggestion. For instance, if small plants were installed which could produce roller-dried milk at a rate of 2s. per 100 gallons, these would soon pay for themselves. Whilst the solubility of milk so treated is reduced, its keeping qualities—as compared with those of sprayed dried milk—are more satisfactory.

Whilst the arguments presented by Burrow, such as the saving in transport and personnel, the improved storage qualities of dried milk and the possibility of building up a milk bank in winter months enabling a readjustment of our calving policy so that animals calve in the spring, seemed on the face of them very valid, they met with considerable and forcible criticism by a number of speakers in discussion.

The C.V.O., Ministry of Agriculture, on the evidence at present available, refuted the suggestion that clean herds are any more susceptible to tuberculosis, and disagreed with the suggestion that vaccination should be incorporated in the Attested Herd Scheme. The latter, he felt, would be a retrograde step and would only complicate matters. Considerable doubt was expressed as to the practicability of inspecting the dairy staff and not only did further speakers uphold the existing legislation relating to milk, which Burrow had described as chaotic, but another speaker pointed out the economic flaws in the argument put forward in favour of installing equipment for the drying of milk on the farm. The cost of maintenance both in labour and fuel and the lack of technical experience were factors which the author of the paper had failed adequately to appreciate.

This paper, which created very considerable interest, received, as might have been expected, very lively criticism.

II.—The Hygienic Preparation of Meat Carcases

Mr. Bywater opened his paper with a general criticism of the hygienic conditions which still prevail at many slaughterhouses to-day despite the reduction in numbers which took place as a result of war-time conditions. He drew attention in detail to many of the deficiencies, pointing out that the opportunities for the bacterial contamination of sound meat are still very great and that this happens all too frequently. He stressed that the design of many slaughterhouses is unsatisfactory. Space is inadequate and a high proportion of the personnel involved are lacking in instruction ; the clothing of those employed needs standardisation and is far from satisfactory.

In some slaughterhouses rats and mice are all too common and too little is done about fly contamination. The filthy cloth used for cleaning carcases is still almost a permanent fitting in many places. He thinks that more care should be taken in the construction of the lairage and better attention given to the animal prior to slaughter. Often the former lacks adequate bedding and the dirt and filth which build up contaminate the hide of the animal, resulting in carcase soiling at the time of dressing.

The rested, clean animal is undoubtedly the better proposition when it comes to the point of slaughter. Within the slaughterhouse more attention should be paid to the consistent cleansing of the floors with adequate water and the appropriate use of disinfectants especially the quaternary ammonium compounds.

An extensive and enlightened discussion followed the paper, most of those participating strongly supporting the view of the reader of the paper, and his recommendations that methods should be improved.

N. S. B.

REVIEW

[Index of Diagnosis (Clinical and Radiological) for the Canine and Feline Surgeon. By Hamilton Kirk, M.R.C.V.S. Fourth Edition: 1953. London: Bailliere, Tindall & Cox, 7 & 8, Henrietta Street, London, W.C.2. Pp. 667 + viii. 326 Figs. Price 45s.]

Reviewing, if it is done conscientiously, is hard work. Almost anybody can get together a few bitter and brutal sentences: but if criticism is to be of any value it must sometimes be unfavourable and the more one knows of the inner life of authors and their difficulties, the more one shrinks from giving pain. On the other hand, one pleasure survives, and will it is hoped survive to the last—the noble pleasure of praising.

No one who is familiar with the earlier editions of Hamilton Kirk's Index of Diagnosis will be surprised that a fourth edition has been called for. First published in 1939, this book has run through three editions and one reprinting.

Based on the author's 40 years of clinical experience in small-animal practice, which he has supplemented by wide reading, the book is built up on sound foundations. It can fairly be described as a veritable mine of information. To many the arrangement of the subject matter will provide a means of ready access to information required and yet it cannot be said that the index system of arrangement precludes a reader who is browsing through the book enjoying the lucid presentation of so much interesting material.

Naturally a man of such experience as the author develops strong opinions of his own and quite rightly he does not hesitate to express them, but where necessary he presents in a very fair way different opinions that may prevail in regard to problems, an excellent example of this being the very lucid section on changes in intervertebral discs to be found on pages 315 to 318.

The author's plea on page 387 for the use of more correct designations of disease is one that is most timely and the simple nomenclature he advocates of Canine distemper of Carré, Paradistemper and Canine viral hepatitis has much to commend it.

Going through the book, it would be quite simple to pick out small errors or omissions but these must be taken in relation to the great mass of accurate information given. It would, for instance, have been helpful to find some details of the newer rat poisons antu and warfarin, though possibly these were not available at the time of going to press.

Many of the illustrations have been taken from other text-books, but the majority of the X-ray illustrations are made from the author's own films. It would add to the interest of a future edition if the author would replace many of the present illustrations with photographs of his own cases or diagrams of his own preparation.

NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY

COUNCIL MEETING IN MANCHESTER

A Council meeting of the Society was held in Manchester on February 19th, 1953, with Mr. John Holroyd, F.R.C.V.S., presiding.

Defence Fund Claims

In all, 24 cases were considered, including 14 new cases. Of these, six cases were regarded as closed; two cases had been settled at a cost of £210; one claim had been withdrawn; five cases were regarded as outside the scope of the Defence Fund; two cases had been settled before being referred to the Society and eight cases were still pending. Legal expenses of £39 4s. had been paid in dealing with the closed and settled cases. Among the more important and new cases were the following:—

Claim No. 10/52.—Case settled, the Society paying half the damages amounting to £175, the other half being borne and paid by the manufacturing chemists concerned. Taxed costs paid by the Society amounted to £35 and the solicitor's account had still to come in.

An appreciative letter from the member was read.

Claim No. 18/52.—Settlement reached in the sum of £35.

Claim No. 31/52.—Alleged wrong diagnosis as to pregnancy of pedigree heifer. Found to be in-calf when slaughtered. Claim settled by member through his own solicitor before being reported to Society. Agreed no negligence and no liability and that no assistance could be given. Rule 21 applies.

Claim No. 32/52.—Budgerigar escaped from surgery during treatment. Claim settled by member before reported. No assistance. Rule 21 applies.

Claim No. 34/52.—Wrong cat of two destroyed. Apparent negligence by both owner and member, and settlement at lowest figure authorised.

Claim No. 38/52.—In pressing for fees, member threatened with counter-claim for death of a cow from unspecified cause after treatment by assistant. Member advised Society would defend or settle counter-claim as necessary.

Claim No. 2/53.—Negligence alleged in diagnosis and treatment of pigs by assistant. Condition eventually confirmed as swine fever. Case referred to Society's solicitors for advice and necessary action.

Claim No. 3/53.—Farm assistant kicked or horned in ribs whilst holding cow for veterinary examination of mouth. Agreed not a Defence Fund matter and one normally covered by Third Party Insurance.

Claim No. 5/53.—Five pigs died out of 15 treated with worm powders. Agreed manufacturers' views and opinions be obtained in writing, in view of verbal admission of error in supply, and that action be taken on their reply.

Other Matters

Other matters dealt with included:—

Benevolent Fund.—A new application for a grant from the Fund made on behalf of the widow of a veterinary surgeon was considered and action thereon was initiated. An interim grant of £5 per month was approved.

Donation.—The receipt of a donation of £175 8s. 3d. from the B.V.A., being part of the surplus on its Insurance Scheme, was gratefully recorded.

EUROPEAN SEMINAR ON ZOONOSES

FIVE MAJOR DISEASES DISCUSSED IN VIENNA

A European Seminar on Zoonoses (animal diseases transmissible to man) sponsored by the European Regional Office of the World Health Organisation and the Food and Agriculture Organisation, was held in Vienna from November 24th to 29th, 1952. The meeting took place in the Institute of Hygiene of the University of Vienna, and in the Institute of Bacteriology and Animal Health at the Veterinary School of Vienna. The purpose of the meeting was to bring together medical and veterinary administrators and laboratory workers to discuss certain diseases of public health and economic importance in Europe. The following five zoonoses were selected for consideration as being of broad interest to most countries of the European region: bovine tuberculosis, brucellosis, leptospirosis, Q fever and rabies.

Sixty senior medical and veterinary officials from 20 European countries attended. The countries represented were Austria, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Morocco, Norway, Netherlands, Portugal, Spain, Sweden, Switzerland, Tunisia, Turkey, United Kingdom and Yugoslavia.

General view of the amphitheatre of Vienna University's Institute of Hygiene during discussion on leptospirosis. Shows Dr. A. W. Stableforth (Director of the Veterinary Laboratory of the Ministry of Agriculture, U.K.) front row, second from right, and Mr. J. N. Ritchie (Chief Veterinary Officer, U.K.) at end of row behind.

Nine leading experts acted as discussion leaders and gave laboratory demonstrations on various aspects of the diseases under consideration. Steps are being taken to publish the comprehensive technical papers prepared for this meeting by the discussion leaders. They were:—

Bovine tuberculosis:
Mr. J. N. Ritchie, Chief Veterinary Officer, Ministry of Agriculture and Fisheries, Tolworth, United Kingdom; Professor K. A. Jensen, Professor of General Pathology, University of Copenhagen; and Sir Thomas Dalling, Chief Veterinary Consultant, FAO.

Brucellosis:
Dr. A. W. Stableforth, Director, Ministry of Agriculture and Fisheries, Veterinary Laboratory, Weybridge, United Kingdom; Dr. G. Renoux, Pasteur Institute, Tunis; and Sir Thomas Dalling.

Leptospirosis:
Professor B. Babudieri, Istituto Superiore di Sanita, Rome; and Professor J. W. Wolff, Chief, Leptospira Research Laboratory, The Royal Tropical Institute, Amsterdam.

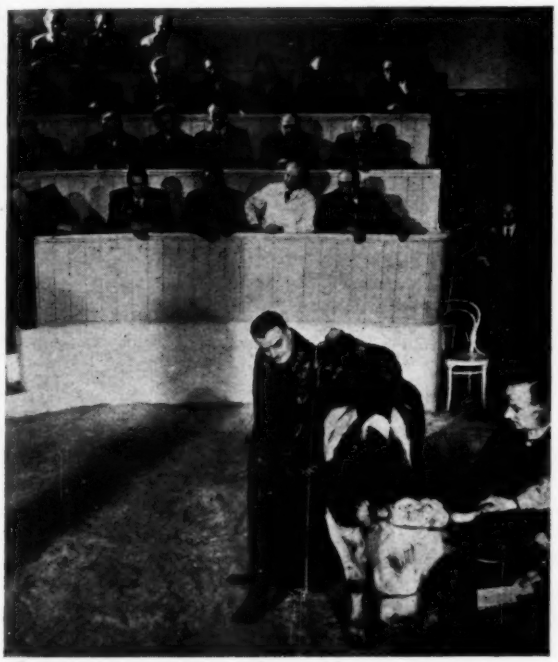
Q Fever:
Professor B. Babudieri; and Dr. M. M. Kaplan, Chief Veterinary Public Health Officer, Division of Communicable Disease Services, WHO

Rabies:

Professor P. Lépine, Pasteur Institute, Paris; and Dr. M. M. Kaplan.

The meeting was opened by high public health and agriculture officials of the Austrian Government, Dr. Norman D. Begg, Director of the WHO Regional Office for Europe, and Sir Thomas Dalling, Chief Veterinary Consultant of FAO. Mr. Erik Holager, Veterinary Public Health Officer for the European Regional Office of WHO, acted as Secretary of the conference.

The Zoonoses meeting in Vienna represents another approach in European international activities for improving public health and economic conditions by encouraging the idea of close collaboration between public health and agricultural departments in their aim of controlling diseases common to man and animals. This idea is gaining momentum in many countries and gives rich promise for the future that several important zoonoses will be brought under effective control and in some instances completely eradicated.



Mr. J. N. Ritchie, Chief Veterinary Officer to the Ministry of Agriculture (U.K.), demonstrates the PPD tuberculin testing of cows in Vienna's Veterinary Medical School.

The opening, and welcoming, paper was read as follows by the Director of the WHO Regional Office for Europe.

Zoonoses in Europe

BY

Dr. N. D. Begg,

Director, WHO Regional Office for Europe

I bring to you the best wishes of our Director-General for the Seminar discussion which opens to-day in the lovely surroundings of Vienna.

The purpose of this meeting is to bring together medical and veterinary officials to discuss certain diseases of public health and economic importance. The term "Zoonoses" is a useful one, although fairly new in the vocabulary of public health, to denote diseases of animals transmissible to man. Amongst the documents to be distributed there will be the report of a Joint WHO/FAO Expert Advisory Group on Zoonoses which deals with the subject in general, and devotes special attention to five of these diseases. In the Annexe of this report are listed more than 80 zoonoses, but as regards European countries, perhaps 10 or 15 can be said to occupy a position of importance. Five of these diseases have been selected for consideration at this meeting from the standpoint of broad interest to the countries of Europe.

In the organisation of this meeting we have kept in mind that participants include both administrative officers and laboratory workers and we hope that the presentation of the subjects will be of interest to both groups. The value of an administrative officer, or one engaged in field control of a disease, is considerably enhanced when he has some familiarity with the laboratory aspects of the disease in question.

Proper utilisation of the laboratory, and correct interpretation of the results obtained therein, can be achieved only when correlated with a clinical or epidemiological background of a given test. For those of you present who are not laboratory specialists, we hope that the laboratory demonstrations will give you a general view of the procedures involved and that you will pass on the detailed descriptions contained in the documents you receive to specialist colleagues in your own country.

The same applies to the laboratory specialists who are present to-day. Acquaintance with the broad clinical, epidemiological and administrative aspects of a disease problem adds greatly to the interest and value of the laboratory work concerned.

I believe we may all agree on the usefulness of bringing together administrative or field men and laboratory workers for a discussion, and the combination of medical and veterinary workers in fields of mutual interest is a logical and necessary step. Particularly does this apply to the zoonoses where a combined medical and veterinary approach within a public health programme constitutes surely a most effective means of meeting these problems. Until fairly recently most countries have tried to meet zoonoses problems through unilateral efforts of Ministries of Health or Agriculture, devoting attention only to that part of the problem which concerned them specifically, the disease in humans or animals. Often the results have left much to be desired because neither group, public health or agricultural, could fix where their responsibility begins or ends. At the extremes one could say that the agricultural interest was primarily an economic one among animals, and that of public health was human infection. But between these two there is a large and important field on which many countries are now concentrating.

The most effective measure has been to bring together the resources of both the public health and agricultural authorities and to focus these combined resources on their mutual problems. If nothing else, self-interest of the two groups dictates the necessity for this approach. The prevention and abolition of zoonoses in human beings can be accomplished by control of these diseases in animals, so that it is natural for public health officials to give every assistance—moral, financial, scientific, educational—to the agricultural authorities in carrying out animal disease control programmes. Practically speaking, this can take the form of financial subsidies in, say, bovine tuberculosis and brucellosis control programmes; fostering research and epidemiological surveys in newly emerging problems such as Q fever and leptospirosis; popular education in the control of rabies and hydatidosis, and many other ways as will become evident during the course of the discussions. The contributions of the agricultural and veterinary authorities are evident in their position as front-line troops tracking down the source of infection—the animal—applying the measures of control and eradication, co-operating in surveys, and in educating the farmers.

It must be kept in mind, however, that attention to the zoonoses is only one of the responsibilities of the public health veterinarian. Another major responsibility is food hygiene. WHO and FAO are considering a meeting along the lines of the present one with respect to discussing European problems on food hygiene with particular attention to meat hygiene.

To integrate the efforts of public health and agricultural authorities, a natural development and successful device in recent years has been the organisation of veterinary public health units in many countries, usually within the organisational framework of municipal, district or federal departments of health.

These units act as the bridge connecting public health and agricultural resources and interests, and serve to synthesise the attack on the various problems of concern to each group. Their size and degree of active operation in the field vary in different countries according to local conditions. As with all new concepts, veterinary public health has met with a mixed reception in different countries, enthusiastic in some and cautious in others. One of the surprising facts is the rapid development of this new idea in many countries, which indicates that it is meeting a real need. The scope of veterinary public health is broader than that of zoonoses, comprising in addition, for example, food hygiene. More information on this subject will be found in the document referred to previously concerning the Joint WHO/FAO Expert Advisory Group on Zoonoses.

This meeting, therefore, besides giving us an opportunity to exchange knowledge and information on the latest developments in the zoonoses under discussion, will, I hope, encourage closer co-operation between medical and veterinary, public health and agricultural, authorities so that we can make accelerated strides in lessening the public health and economic toll exacted by these diseases. With such close co-operation we can rest assured that our responsibilities to the community will be fulfilled with much greater efficiency and will yield far more productive results than if each of our groups worked separately.

Here Professor Kress (Austria) is demonstrating tuberculous lesions in the organs of a slaughtered cow at the Vienna Veterinary Medical School during the Seminar. Beside him is standing Dr. A. W. Stableforth, Director of the Ministry's Veterinary Laboratory, Weybridge, England.

Kennel Club Show Regulations

The attention of veterinary surgeons who officiate at shows held under the auspices of the Kennel Club is drawn to the fact that, as was intimated in our issue of last week, the Kennel Club does not prohibit the exhibition of cryptorchids or monorchids.

The following alteration to Kennel Club Show Regulation No. 17 has been made: —

"If any dog is exhibited which has been exposed to the risk of any contagious or infectious disease during the period of six weeks prior to exhibition and/or if any dog shall be proved to be suffering at a Show from any contagious or infectious disease including contagious results of inoculation against distemper, the exhibitor thereof shall be liable to be dealt with under Kennel Club Rule 17."

Members are asked to note the above, and particularly those who have in their possession a copy of the Association's "Guide to Veterinary Surgeons officiating at Small-Animal Shows."

IN PARLIAMENT

Therapeutic Substances (Prevention of Misuse) Bill

In the House of Commons on Wednesday, May 13th, the Therapeutic Substances (Prevention of Misuse) Bill, which has passed the House of Lords, was read the second time.

The Minister of Health (Mr. Ian Macleod), in the course of his speech in moving, said that this Bill, in effect, had only two Clauses. The object of the first Clause was to extend the scope of the Penicillin Act, 1947, which had been found to be too narrow in that it applied only to what were known as the group of antibiotics. It was known that there were three major dangers from inexpert use of these drugs. The first was that it was possible to produce resistant strains if the dosage was inadequate. Second, some of these drugs had unexpected and toxic effects; and, third, self-medication could mask the symptoms of a disease without curing it.

Clause 2, which was known popularly as the "penicillin for pigs" Clause, presented a difficult problem, and the Prime Minister on Monday found accidentally exactly the right word, because what was proposed was indeed a "pigmeal" solution to this particular difficulty. It had been found by experiment in the United States—and they were advised by the Agricultural Research Council—that a minute quantity of antibiotics put into feeding-stuffs could have a most remarkable effect in encouraging growth, and in the fattening, of pigs. The amount of the antibiotic was minute—a proportion of between two and 20 parts in a million. He was assured by the Medical Research Council that there would be no adverse effect whatever upon human beings.

The other danger against which they would guard was the possibility of creating, by this much wider use of antibiotics, a sort of black market in penicillin. The answer to that was that steps would be taken to ensure that the antibiotics were used in such a way that they could not be extracted and used for medication.

At the moment they proposed to apply these regulations only to penicillin, since that was the only substance in this class which they had at present in sufficient quantities. But it was possible that in the future both aureomycin and perhaps terramycin would be manufactured, probably in this country, in adequate quantities for the regulations to be used in a similar way, if the advice was suitable. This was mainly an agricultural matter, and they would, of course, consult the Agricultural Research Council. If necessary—this point was raised in another place—when they consulted the Ministry of Agriculture they would consult, in suitable cases, the Royal College of Veterinary Surgeons.

Mr. Macleod concluded, "The remainder of the Bill is common form. I have said on a number of occasions recently that I have not introduced any legislation into the House of Commons. In sporting terms, I will award myself a bisque in respect of this Bill, partly on the well-known housemaid's plea—that it is only a little one—and partly because it is not my Bill at all in respect of the innovation in Clause 2. It extends, and I think wisely extends, the 1947 Act, which has been found to be too limited, and it brings forward a new and most interesting use for antibiotics which might have a most important effect on the foodstuffs of this country."

Mr. Hugh Linstead, supporting the motion, said the provision in Clause 1 to extend the power of the Minister was one which it was becoming more and more clear that the Minister of Health must possess as the applications of modern medicine became more and more apparent. "We have a number of statutes which control the distribution of poisonous substances, but there is nothing on the Statute Book which enables control to be exercised over articles which are not poisonous in the criminal sense of the term but which are, in the words of the Clause, 'capable of causing danger to health.' It is very proper therefore that the Minister should take this power.

"When we come to the exemption provisions of Clause 2," Mr. Linstead continued, "we are entering into unknown country. We are still groping as to the effects of feeding penicillin to pigs and other livestock. We have not been doing it long enough, I feel, to know what effect it will produce in the long-term on herds and on meat and, indeed, on human beings who eat the meat. I was very glad to hear the Minister say that he proposes to keep in touch with the manufacturers as he develops his regulations, because the manufacturers are concerned about this question of the distribution of penicillin; not merely from the point of view of their manufacturing interests, but are also concerned that there shall not be developed, as a result of these exemptions, what might be called a black market in penicillin.

"This drug has acquired a reputation as an efficient and magic cure-all, and, particularly, in the veterinary field, there is

a real danger that, if farmers can get hold of penicillin without having to pay the fee of a veterinary surgeon, they will be tempted to use it carelessly and in a widespread way on their flocks. The whole essence of the Penicillin Act is to prevent that happening, since what we do not want to do here is to open a door which will place large supplies of penicillin at the uncontrolled disposal of the farming community. I am sure that the manufacturers will want to emphasise that point to the Minister, as they have emphasised to me, as something that needs to be taken care of.

"The Minister also said that he would take steps to ensure that material intended for use as feeding-stuffs should be distributed in a safe form, and I hope that, when either he or his Parliamentary Secretary replies, we shall be given an indication at what point in the chain of distribution that barrier is going to be erected. At the moment, there is only the sense of duty on the part of the four or five manufacturers of penicillin which prevents penicillin getting into what I might call the black market. Once we get the manufacturers of agricultural feeding-stuffs for a large rural community in possession of penicillin for the purpose of putting it into feeding-stuffs, we shall not have the same responsible group of firms who will be taking the greatest care to see that it does not get into improper hands. Therefore, I should be grateful if the Minister would indicate how he contemplates carrying into effect the undertaking which he has just given to the House. It may be, of course, that he can do it by means of a condition attached to the Therapeutic Substances Act licence which all manufacturers have.

"I am sure that it is wise that large quantities of this material shall not be let loose into the agricultural community unless it is mixed with some other substance which does not affect its potency as a feeding-stuff, but which does make it impossible for it to be used improperly for medicinal purposes."

Captain J. A. L. Duncan said he rose as a member of the Council of the Royal College of Veterinary Surgeons to say a few words on this Bill, and although the hon. Member for Birkenhead (Mr. Collick) was not there, he thought that what he said that night would be agreed to by him. He also was a member of the Royal College of Veterinary Surgeons. They had been concerned with the Bill because of its effect on animals.

"Why we are so concerned from a veterinary point of view is because regulations may be made under Clauses 1 and 2 to enable the freer distribution, not only of penicillin, but of some new drugs which have not yet been discovered—I am looking to the future—and which may have bad effects on animals although they may be beneficial to human beings. That is why we welcomed the statement in the other place, giving the assurance that both under Clause 1 and Clause 2 the Royal College of Veterinary Surgeons would be consulted before regulations were made. The speech of my right hon. Friend this evening said only that the College would be consulted in certain cases in connection with Clause 2. We are concerned with the effect on animals in this uncharted field.

"There are other effects on animals and we do not know very much about them. New drugs are invented by the scientists and tried out on guinea-pigs, human or otherwise. They gradually extend to the human being, and then some enthusiast, usually in America, tries them out on animals and they are a great success in the beginning. Even in the case of penicillin I do not think that anybody really knows yet whether pigs for breeding, fed on penicillin, will, in the end, become resistant to penicillin or lose fertility.

"In the case of the new drug auromycetin, and new drugs still undiscovered, there is still further danger. We ought to issue a grave warning to farmers in England and in Scotland that if they use such a drug for fattening pigs for slaughter it will be all right, but if they use it for rearing pigs for breeding there is the danger, to which there is no answer yet in veterinary or medical science, of loss of fertility which may have serious consequences for farmers breeding pedigree pigs."

The same applied to chickens. It was all right to fatten table poultry, although we did not know yet whether the effect of penicillin through the generations even on table poultry would be bad. "When it comes to breeding poultry, as in breeding pigs, we do not know enough of the effect on fertility and on the quality of the breed. In this country the quality of our cattle and livestock is so important that warnings should go out to farmers from the Departments in England and Scotland to be very careful how they use these substances on cattle and sheep.

"I should like to be reassured by my right hon. Friend, on behalf of the Royal College of Veterinary Surgeons, that they will be consulted on these matters. It is of vital importance to the future of our livestock industry, using that term in its widest sense, that we should have every possible safeguard for our livestock. If the Minister would give that assurance, I assure him, in return, that he will have every co-operation from the veterinary staff and service in this country."

The Joint Parliamentary Secretary to the Ministry of Agriculture (Mr. G. R. H. Nugent) said he was glad to hear such a general welcome to this little Bill. In the short debate they had had on the subject a number of interesting points had been made, largely directed towards Clause 2 and the possible effects that might follow in the agricultural world.

"On the point made by my hon. and gallant Friend the Member for Angus, South (Captain Duncan) I can give him the assurance he sought, which is to the effect that my right hon. Friend the Minister of Health will be consulting my right hon. Friend the Minister of Agriculture, and that there will be consultations with the Royal College of Veterinary Surgeons on many matters concerning both Clauses 1 and 2 where agricultural and veterinary considerations are concerned. I can assure my hon. and gallant Friend that consultations are at present in progress, as the regulations are in course of drafting, and I am sure that we shall benefit from the advice we receive.

"To turn to the general issue, this Bill has a very great interest for the farming world. Farmers have seen these antibiotics fed in America in the last few years and have seen the very valuable results obtained in a limited field there. They are naturally anxious to see the same facilities extended here and, therefore, this Measure will be welcomed when they are able to use penicillin in feeding-stuffs here. The use is so great in the United States that it is brought into something like a quarter of the compounded feeding-stuffs in that country."

The figures given (in the course of the debate) with regard to the commercial value of the inclusion of antibiotics in feeding-stuffs were, broadly speaking, confirmed by work done by the Agricultural Research Council, preparatory to the introduction of this Bill. The Council found a figure of approximately 8 per cent. for speedier growth and approximately 5 per cent. for better food conversion. He thought the best view was that aureomycin probably gave a slightly better rate for feeding up pigs and penicillin for poultry. The antibiotic was not a food of the gods or a magic wand: it only removed some natural obstacle holding the animal back. "If we look at it in that light, which is unconfirmed but is probably the explanation, it is unquestionable that it would be unsound to use these substances for feeding breeding stock, because in the selection of breeding stocks it is vital to choose pigs or birds which have the maximum vigour and resistance to growth depressants. If one fed breeding stock on these substances one would not have the natural selection brought about by environment to show which was the best breeding stock."

Proceeding, Mr. Nugent emphasised the words of Captain Duncan, that in their own interests farmers "should treat the use of this stuff for breeding stock with the greatest caution and should limit its use to pigs for fattening and to table poultry. The rather spectacular results in America may be due to the fact that their compounds contain a greater proportion of vegetable proteins than ours do: where there is a greater proportion of animal protein the reaction is not so great."

As to Mr. Linstead's point about the possible danger of a black market in penicillin after extraction from feeding-stuff compounds, the law would remain the same in respect of the control of sale. Under the regulations it would be illegal to sell feeding-stuffs containing antibiotics other than for the fattening of pigs and poultry. "That controls the antibiotic up to the point of the retail sale to the farmer. As to the possibility of the farmer proceeding to extract, I think that the practical difficulties would make it impossible. Half an ounce in a ton of compound feeding-stuffs would clearly be impossible to extract, and where the antibiotic is sold as a pure feeding-stuff supplement it will be diluted, and diluted again by the farmer to one in 100 or something of that order."

Mr. Linstead: "I entirely agree with my hon. Friend that we would not see the farmer attempting extraction from feeding-stuffs, or, indeed, from concentrates. I was concerned about at what stage between manufacturer and farmer it was proposed to impose some sort of control. It seems to me that at the moment it is proposed to have nothing between the manufacturer and the farmer, and that it will be possible for the farmer even, let alone the feeding-stuffs manufacturer, to buy penicillin to make feeding-stuffs for himself. At what stage will the barrier be put up?"

Mr. Nugent: "The barrier is at the point of sale by the feeding-stuffs merchant. The manufacturer will supply the feeding-stuffs to the merchant, who will have the statutory obligation to sell it only for these purposes. So the position at the moment is exactly the same as it is in the pharmaceutical trade. My right hon. Friend has stressed that the danger to humans is considered to be non-existent, and on that point he has the best evidence of the medical profession, so I hope that hon. Members will be reassured that the dangers of leakage will not be serious."

Mr. Blenkinsop: "Can the hon. Gentleman give any general

indication when we are likely to have the regulations before the House? "

Mr. NUGENT: " As far as I know the drafting of the regulations will be completed concurrently with the passage of the Bill through the House, and it should be possible to lay them within a fairly short time after the placing of the Bill on the Statute Book. From the farming point of view we are most anxious to see that that should be done. The farmers are most anxious to start to use this substance."

The Bill was read a second time and committed to a Standing Committee.

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Questions

MILK SUPPLIES (*Brucella abortus*)

Mr. COOPER-KEY (May 14th) asked the Minister of Food what advice has been given by his veterinary experts as to the danger to the public from the consumption of milk from a cow infected by *Brucella abortus;* and what steps he is taking to prevent animals so infected from being sold as milking cows in the open market.

Major LLOYD GEORGE: I am advised that if milk is infected with the organism of *Br. abortus* there is a risk of the consumer contracting undulant fever, but that an infected cow will not ordinarily give milk containing this organism in large numbers except for a short period after calving. It is an offence under the Food and Drugs Acts to sell for human consumption the milk of any cow which is known to be suffering from an infection of the udder or teats likely to convey disease, and medical officers of health are authorised under the Milk and Dairies Regulations to stop the sale or require the heat treatment of milk if they have evidence satisfying them that it is infected with a disease communicable to man. I am advised by my right hon. Friend the Minister of Agriculture that the Epizootic Abortion Order of 1922 prohibits the exposure in a market of a cow which has calved prematurely within the preceding two months.

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HIDES (WARBLE DAMAGE)

Mr. HURD (May 14th) asked the Minister of Agriculture to give an estimate of the annual loss caused by the warble fly in Britain; and if he will ask the Agricultural Research Council and the Agricultural Improvement Council to recommend more effective measures to get rid of this pest as Denmark has done.

Mr. NUGENT: The estimated loss resulting from warble damage to hides sold by the Ministry of Food during 1952 was about £414,000. Research on this subject is being conducted at my Department's Veterinary Laboratory and we are also watching closely the progress of research in other countries. My right hon. Friend does not think that any advantage would result from reference to the Agricultural Research Council or the Agricultural Improvement Council.

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SLAUGHTER OF HORSES: ENQUIRIES COMPLETED

Mr ERIC JOHNSTON (May 18th) asked the Minister of Food whether the committee under the Chairmanship of the Duke of Northumberland had completed its enquiries into conditions governing the slaughter of horses.

Major LLOYD-GEORGE: The Committee has completed its enquiries. The report is being drafted and the Chairman hopes to submit it to the Secretary of State for Scotland and myself before July 31st.

NOTES AND NEWS

Diary of Events

May 26th.—Meeting of the Welsh Branch, B.V.A., at Newtown (the Bear Hotel), 2.30 p.m.

R.C.V.S. ENGAGEMENTS IN EDINBURGH

May 27th to 29th, 1953, R.C.V.S. Committee and Council Meetings: Quarterly Meeting of Council, May 29th; preceeded by Special Meeting of Council. At the Royal (Dick) School of Veterinary Studies, Edinburgh, 9.

May 27th.—Annual General Meeting of the R.C.V.S., 4 p.m., to be held at the Royal (Dick) School of Veterinary Studies, Edinburgh, 9.

May 27th.—Annual General Meeting of the Victoria Veterinary Benevolent Fund, 4.30 p.m., to be held at the Royal (Dick) School of Veterinary Studies, Edinburgh, 9. R.C.V.S. Dinner in Edinburgh, 7 p.m.

May 28th.—Annual General Meeting of the Herts & Beds Division, B.V.A., at Luton (The George Hotel), 7.30 p.m.

May 28th.—Spring Meeting of the Eastern Counties Division, B.V.A., at Ipswich (Great White Horse Hotel), 11 a.m.

May 29th.—Meeting of the Royal Counties Division, B.V.A., at Oxford (The Randolph Hotel), 2.30 p.m.

May 30th.—Annual General Meeting of the Society of Women Veterinary Surgeons, at the Royal Veterinary College, N.W.1, 2.30 p.m.

June 6th.—Meeting of the Scottish Branch, B.V.A., at Glasgow University Veterinary School, 2.30 p.m.

June 10th.—Summer Meeting of the Southern Counties Division, B.V.A., at Winchester. (See Notice.)

June 11th.—Annual General Meeting of the National Veterinary Benevolent and Mutual Defence Society at Manchester (Midland Hotel), 2.30 p.m.

June 12th.—Annual Dinner of the R.A.V.C. Officers' Club, at Grosvenor House, London.

June 18th.—Summer Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at the Wellcome Research Laboratories, Langley Court, Beckenham, Kent, 2 p.m.

June 19.h.—Annual General Meeting of the Association of Veterinary Teachers and Research Workers (Scottish Regional Group) in the University of Glasgow Veterinary School, 2 p.m.

B.V.A. TECHNICAL DEVELOPMENT COMMITTEE TWO-DAY MEETING

Wednesday, June 24th

2.30 p.m., Technical Development Committee at 36, Gordon Square, London, W.C.1.

Thursday, June 25th

10.30 a.m., Technical Development Committee at 36, Gordon Square, London, W.C.1.

Aug. 9th—15th.—XVth International Veterinary Congress, Stockholm, Sweden.

Sept. 6th—12th.—Seventy-first Annual General Meeting and Congress of the British Veterinary Association, at Aberdeen.

R.C.V.S. EXAMINATIONS

Thursday, June 4th.—D.V.S.M. Written Examination commences at Edinburgh (2 p.m.).
Monday, June 8th.—D.V.S.M. Orals and Practicals.
Thursday, June 25th.—M.R.C.V.S. Written Examinations.
Friday, June 26th.—Ditto.

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R.C.V.S. Dinner in Edinburgh

We would remind our readers that the annual general meeting of the Royal College of Veterinary Surgeons at 4 p.m. on Wednesday, May 27th, at the Royal (Dick) School of Veterinary Studies, University of Edinburgh, will be followed by a dinner for all members of the Royal College of Veterinary Surgeons and their ladies at the North British Hotel, Edinburgh. This will be at 7 p.m. for 7.30 p.m. (evening dress). The cost will be £1 per person, inclusive of coffee but not of drinks. Applications for tickets, together with remittance, should be made to:—

The Registrar,
R.C.V.S.,
9, Red Lion Square,
W.C.1,

who will supply any other information which may be required.

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SOCIETY OF WOMEN VETERINARY SURGEONS

PROPOSED TOUR OF CORONATION DECORATIONS

It is hoped to have a few cars available after the meeting on May 30th to take any members or visitors who may be able to stay on for a short informal tour of some of the London Coronation decorations.

PERSONAL

Appointments.—The appointment in Cambridge University Veterinary School is announced of Mr. John Seamer, B.Sc. (EDIN.), M.R.C.V.S., as University Demonstrator in the Department of Veterinary Clinical Studies with tenure from April 1st last for three years.

The Colonial Office announces the following appointments in its Veterinary Services: Mr. A. H. Milne, M.R.C.V.S., Veterinary Officer, Tanganyika, to be Chief Veterinary Research Officer, Tanganyika, and Mr. J. B. Randall, B.A., M.R.C.V.S., Deputy D.V.S., Uganda, to be Director of Veterinary Services and Animal Husbandry, Uganda.

The appointment also is announced of Messrs. A. Gregor, M.R.C.V.S., and D. A. Hutchings, M.R.C.V.S., as Veterinary Officers, Northern Rhodesia.

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Site of Glasgow's New Veterinary School.—"For many of the visitors who attended the Glasgow University Veterinary School rodeo in Garscube Estate," says the *Glasgow Evening News*, "it must have been an eye-opener to learn that the University owned such a delightful rural showplace.

"The estate, bought about four years ago, is only in the initial stages of its development. It will be the site of a new veterinary school, now under construction, while the estate mansion, at the moment occupied by members of the University staff, has been earmarked as a hostel for veterinary students."

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Birth.— BAXTER.—On May 12th, 1953, to Muriel (*née* Knox), wife of J. T. Baxter, M.R.C.V.S., Century House, East Bridge Street, Enniskillen, a son, Brian.

CLARKE.—On May 16th, to Barbara (*née* Cayless) and Peter B. Clarke, B.S.V.SC., MS.R.C.V.S., a daughter (Nicola Jane). May Croft, Hyde End Road, Shinfield, Berks.

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MINISTRY OF AGRICULTURE

We are informed that Mr. C. P. Quick has succeeded Mr. W. C. Tame as administrative head of the Animal Health Division of the Ministry of Agriculture and Fisheries on the latter's appointment as an Under-Secretary in the Department. It is understood that the group of Divisions for which Mr. Tame is now responsible includes the Animal Health Division.

Veterinary Field Staff.—The following has recently been announced: Mr. A. J. James, B.SC., M.R.C.V.S., was transferred from Chelmsford to Gloucester on May 18th, 1953.

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Royal Army Veterinary Corps.—Announcement is made in the issue of *The London Gazette* (Supplement) dated May 8th, 1953 (National Services List), of the promotion of Lieutenant R. Peacock to be Captain (April 21st, 1953).

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R.C.V.S. OBITUARY

NOEL, Edward Francis Hamlyn, M.R.C.V.S., Major (Indian Army) (retd.), 81, Military Road, Colchester. Graduated London, July 4th, 1944. Died suddenly on May 12th, 1953; aged 54 years.

KEYLOCK, Harry E., F.R.C.V.S., Major R.F.A. (T.F.) (retd.), of Falmouth House, Newmarket, Suffolk. Graduated London, May 16th, 1895; Fellowship May 12th, 1906. Died May 5th, 1953.

Major H. E. Keylock, F.R.C.V.S.

We record above with much regret the death at his Newmarket home of Major Harry Keylock, who had been in failing health for some years.

In the course of a tribute in *Horse and Hound*, "Audax" says of him: "A Fellow of the Royal College of Veterinary Surgeons, Major Keylock devoted the latter part of his life to the management of stud farms, among them the Brickfield Stud at Newmarket, and the compilation of works of reference for bloodstock breeders.

"Perhaps the most famous of these are his Thoroughbred Pedigree Charts, the third edition of which was published in 1952. These charts have proved invaluable to breeders, who have been enabled to see at a glance the descent or relationship of particular animals and to appreciate quickly the value of a line. Previous to the appearance of these charts this could only have been done after laborious research in the Stud Book.

"Another of Major Keylock's publications on which breeders have come greatly to rely is his 'Dams of Winners.' This publication was brought up to date from time to time and now covers the years 1915 to 1949.

"Major Keylock was a man of great personality. His death removes an outstanding character from the racing scene."

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Foot-and-mouth Disease Committee of Enquiry

The Committee, under the Chairmanship of Sir Ernest Gowers, set up by the Minister of Agriculture in the autumn of last year to review the policy and arrangements for dealing with foot-and-mouth disease in Britain, is at present visiting various countries in Western Europe in pursuance of its obligation eventually to advise the Minister as to whether any changes should be made in the light of present scientific knowledge and the technical and administrative experience gained in recent years in this and other countries. According to the Hague Correspondent of *The Times*, the Committee, which already had visited France and Belgium, were told during a stay in the Netherlands this month, that during the epidemic of 1952 the stock of cattle in the Netherlands, thanks to general vaccination against foot-and-mouth disease, did not suffer great losses. During their stay in that country the members of the Committee paid visits to the State Serum Institute at Rotterdam, the State Institute for Veterinary Research at Amsterdam, and the veterinary faculty at Utrecht. The Committee is to visit Denmark and Sweden.

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ROYAL COLLEGE OF VETERINARY SURGEONS

Animal Management Examination, May, 1953

LIST OF SUCCESSFUL CANDIDATES

LONDON:

Archer, F. R.
Baker, K. P.
Barnett, K. C.
Blackmore, D. K.
Bousfield, W. E. D.
Bruford, J. C.
Butler, B. C.
Byrne, G. A. (C)
Chappell, L. A.
Clark-Lewis, A. V.
Cocks, Edwin
Davison, R. S.
Ealden, G. E.
Edgar, R. K. (C)
Fairhall, D. C.
Ford, J. G. B.
Giles, H. G.
Gill, E. A.
Girling, Miss M. J.
Greenwood, Ronald
Heptinstall, Jack
Hime, J. M.
Holland, William
Hollands, J. G. (C)
Hughes, J. R.
Jones, C. R. V.
Jones, W. A.
Kirkpatrick, J. C.
Lawrence, B. T.
McKie, Miss E. M. C. E.
Mason, J. A.
May, J. N. T.
Mullen, P. A.
Nelson, E. P.
Nettleton, L. B.
Newey, R. M.
Noordin, M. B. K.
Oakley, G. A.
Oke, M. A.
Osman, B. D.
Owen, D. P.
Pearce, J. S.
Pocock, E. W.
Ranger, M. J.
Robbins, G. R.
Stevens, H. R.
Stocks, B. M.
Swayne, T. C. B.
Tanner, J. A.
Teale, M. L.
Volrath, J. P. (C)
Watson, Miss D. P.
Wells, B. T.
Wilkinson, John
Wood, George

DUBLIN:

Allen, R. S.
Atock, M. A.
Barnes, Thomas
Cody, O. H. (C)
Costello, E. A.
Cotter, William
Daly, D. J.
Dargan, Peter
Devereux, W. R.
Ennis, Miss Denise (C)
Fallon, G. A.
Handcock, W. J.
Hurley, J. D.
Hurley, T. J.
Keane, T. A.
Keane, M. J.
Kelleher, D. J.
Kelly, J. A.
Lee, J. G.
McCarthy, William
Mangan, P. J.
Murphy, P. A. (C)
Nolan, P. J.
O'Connor, J. J.
O'Driscoll, John
O'Hare, M. B.
O'Mahony, Jeremian (C)
O'Sullivan, D. C.
O'Sullivan, F. J.
Teevan, R. J.
Wallace, James

(C) denotes credit.

EDINBURGH:

Brown, Miss D. D.	Matthews, R. G.
Camden-Smith, M. J.	Miller, J. K.
Clark, Miss N. D.	Moore, I. E. (C)
Coutts, Kenneth	Morrish, J. S. H.
Cribb, P. H.	Pratt, D. A.
Dodson, G. R.	Robertson, H. L.
Griffiths, P. H. M.	Rowland, A. C.
Harkness, Michael	Rowland, James
Hastie, Hamish	Sedgwick, J. R. W. (C)
Imlah, Peter (C)	Smith, P. J.
Ironside, J. B. R.	Stephens, M. B.
Jones, J. H. (C)	Stretch, I. L.
Kettles, A. S.	Todd, R. H.
Lamont, P. H.	Tordoff, D. B.
Lawrence, J. A. (C)	Walker, W. D.
Leitch, I. D. C. M.	Wastie, Miss P. C.
Macdonald, D. C.	Watt, R. D.
McDougall, G. M.	Witmore, M. M.
McFerran, J. B. (C)	Wilson, G. A.
McHugh, T. M. (C)	

(C) denotes credit.

(To be continued.)

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Pharmacology, Etc., Examination, May, 1953

LIST OF SUCCESSFUL CANDIDATES

LONDON:

Beaumont, S. H.	James, P. H.
Brazier, J. F. H.	Kearns, M. P.
Buxton, Peter	Keeling, M. D.
Cullen, C. S.	Norman, D. A.
Davidson, H. M.	Pigott, R. C. C.
Davies, M. G.	Roberts, D. H.
Gee, R. E.	Russell, G. H.
Hardwick, A. G.	Simons, M. A. P.

DUBLIN:

Barry, K. T.	Huey, J. A.
Boyd, J. R.	Nunn, W. R.
Brownell, T. A.	O'Brien, J. D. P.
Conroy, P. J.	O'Neill, T. J.
Crowley, J. P.	O'Neill, W. J.
Eastwood, P. J.	Poole, D. B.
English, R. A.	Roche, J. V.
Evans, J. A.	Smith, K. J.
Fleury, A. T. J. (C)	Stuart, N. C.
Gahan, M. A.	Taylor, B. O. C.
Harris, R. E. (C)	

(C) denotes credit.

(To be continued.)

* * * * *

SUSSEX HERD BOOK SOCIETY

VETERINARIAN PRESIDENT'S PLEA FOR "COMPROMISE ON A.I."

Those who had the refreshing experience of serving with Mr. T. A. R. Chipperfield, M.R.C.V.S., Barrister-at-Law, on our Editorial Committee will be in no way surprised to learn that during his year of office he has exerted a similarly enlivening influence on the Sussex Herd Book Society, of which he was elected President in the early summer of 1952: he is renowned as a judge and breeder of Sussex cattle.

Mr. Chipperfield, presiding at the Society's annual luncheon held recently in London, said that many breeders were worried by the tidal wave of artificial insemination which seemed to be sweeping the country. The M.M.B. expected to breed 1,250,000 of the 4,400,000 cattle population by A.I. The proportion of A.I.-bred cattle might rise and fall in the future, but he felt that cattle-breeders were getting a little out of their depth with the problem. A.I. had been intended for the improvement of "scruffy" herds not for use in established studs. Reduction of the bull population which resulted from excessive use of A.I. would mean a contraction of the genetic reservoir of the breed. If they were not careful we would reach the stage where the experience and knowledge of the British livestock breeder would be sunk in the M.M.B. The great hope of breeders was that the issue would be settled by the British genius for arriving at a compromise.

DE-HORNING

At the annual meeting, according to the *Farmer & Stock-breeder*, in spite of staunch opposition from Mr. R. Hales, the Society decided that "artificially de-horned cattle should not be at a disadvantage with horned cattle in the show ring." This motion, proposed by the incoming President, Mr. C. Harman Hunt, was carried by 18 votes to four. Mr. Chipperfield said that the Council had already agreed to accept de-horned cattle for registration if it was stated that the animals were de-horned. He contended that if animals were registered Sussex cattle they were eligible for exhibition at any show. This brought Mr. Hales to his feet with the assertion that horns were one of the breed's most important characteristics. He "wouldn't look at" a de-horned Sussex where some entries had horns. Mrs. C. Cheeseman said that she personally had had many letters from breeders overseas who said they were very pleased to hear that British herds were starting to de-horn and an equal number said they were glad that hornless Sussex were now being bred.

It was the generally expressed view that the breed should move with the times. It was easier to rear hornless stores and if they did not permit de-horning, overseas breeders would buy cattle which had been de-horned.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Argyllshire.—New Peninver Farm, Campbeltown (May 8).
Berks.—Brockdale Cottage, Warfield, Bracknell (May 9).
Derbys.—Headlow Fields Farm, Snelston, Ashbourne (May 8).
Dumfries.—Drum Farm, Thornhill (May 9).
Essex.—Dengewell Hall, Wix, Manningtree (May 11).
Glos.—Leaze Farm, Lechlade, Cirencester (May 12).
Lancs.—Brinscall Hall Farm, Chorley, Lancs (May 8); Church Grove Farm, Wrea Green, Kirkham, Preston (May 9).
Salop.—Trysull Farm, Trysull (May 8); Middleton Green Farm, Leigh, Stoke-on-Trent; Top Farm, Vennington, Westbury, Shrewsbury (May 9).
Surrey.—Garbon's Farm, West End, Esher (May 13).
Yorks.—Castle Bolton Lane, Castle Bolton, Redmire, Leyburn (May 8); Foxall Farm, Thornhill Edge, Dewsbury (May 14).

FOWL PEST:

Berks.—Graham Poultry Farm, Oakley Green, Windsor (May 13); 1, Cresswell Cottages, Holyport, Maidenhead (May 14).
Essex.—Ninon, Moorcroft Avenue, Thundersley (May 8).
Hants.—15, Reading Road, Farnborough (May 8).
Middlesex.—Poleshill Farm, Hillingdon, Uxbridge (May 11).
Northants.—The Orchard, and 4, Oundle Road, Alwalton, Peterborough (May 14).
Surrey.—Wood Hatch Farm, Reigate; Gadbrook Farm, Betchworth; 18, 20, 22 and 24, Stoughton Road, Guildford (May 8); 29, Meadowlands, West Clandon, Guildford; Little London, Albury, Guildford; Churt Lea, Churt, Farnham; Rushett's Farm, Wood Hatch, Reigate; 4, Silver Birch Cottages, Churt, Farnham; L'Alise, Guildford Road, Godalming; 10, Cliffe Road, Godalming; 1, Binscombe Lane, Godalming; 2, Laurel Cottage, Stokesfield, Guildford (May 12); Bullswater Lodge Farm, Pirbright, Woking; 3376, Witley Camp, Witley, Godalming.

SWINE FEVER:

Beds.—1, St. Margaret's Cottages, Renhold, Bedford (May 14).
Berks.—Gravel Pits, Radley Road, Abingdon (May 11); 6, Victoria Road, Owlswore, Crowthorne (May 14).
Cambs.—Balcony Farm, South Brink, Wisbech (May 14).
Ches.—Lilac Cottage, Treapwood, Malpas (May 12); Lisburn Farm, Lisburn Lane, Offerton, Stockport; The Home Farm, Maesfen, Malpas (May 14).
Denbigh.—Craig Wen Farm, Wrexham (May 12).
Derbys.—Siddals Road Allotments, Derby (May 11).
Durham.—Little Whessoe Farm, Cockerton, Darlington (May 11).
Essex.—Frith's Farm, Stones Green, Tendring, Clacton-onSea; Crosby, Grange Road, Tillingham, Southminster; Church Farm, Toppesfield, Halstead (May 11); "Sandhayes," Clay Lane, St. Osyth, Clacton-on-Sea; Nimrod's Cottages, Halstead Road, Eight Ash Green, Colchester (May 12); Skreen's Park, Roxwell, Chelmsford; Rectory Road, Tolleshurst Knights, Maldon; Burnt House Farm, Stebbing Green, Stebbing, Chelmsford; Stanley Park Piggeries, Cooper's Lane, Clacton-on-Sea (May 13); Shaw's Piggeries, Great Leighs, Chelmsford; Blackmoore End, Braintree (May 14).
Flints.—Canalside, Bettisfield, Whitchurch (May 11).
Glos.—The Holmstead, Elmstone Hardwicke, Cheltenham; Fair View, Mayhill, Longhope (May 11); Butler's Yard, High Street, Blakeney; The Meadows, Bromsberrow Heath, Dymock; The Bakery, Nailbridge, Drybrook (May 12).

Hants.—Old Albury Farm, Blackmoor, Liss (May 11).
Herefords.—Stony Hill, Woolhope, Hereford (May 11).
Herts.—Fold Farm, Galley Lane, Barnet (May 12); Riddy Park Farm, Bedford Road, Holwell, Hitchin (May 14).
Kent.—West Yoke Farm, Ash, Sevenoaks (May 11); 89, Abbey Road, Belvedere (May 13); New Boston Farm, Church Road, Haydock, St. Helens (May 14).
Lancs.—High Green Farm, Middleton (May 13).
Lincs.—Racer Farm, Witham-on-the-Hill, Bourne (May 11); White House, Station Road, Old Leake, Boston (May 12).
Montgomery.—Tyddynysais, Bwlch-y-Cibau; Rhosgallt, Llanerfyl, Welshpool (May 11); Penystryt, Brithdir, Llanrhaiadr (May 14).
Norfolk.—Lillian Road, Spixworth, Norwich; Saham Grove Farm, Saham Toney, Thetford (May 11); Smeeth Farm, Smeeth Road, Wisbech (May 13); Redhouse Farm, Forncett St. Mary, Norwich; The Laurels, Forncett St. Peter, Norwich; The Bell, Aslacton, Norwich (May 14).
Oxon.—South View, Freeland, Oxford (May 11).
Rutlands.—28, Empingham Road, Exton, Oakham (May 11).
Salop.—Heath House, Dudleston Heath, Ellesmere (May 11); Lower House Farm, Cardiston, Ford, Shrewsbury (May 12); Common House, Weston Lullingfield, Baschurch, Shrewsbury (May 13).
Somerset.—Elm Park, Chewton, Keynsham, Bristol (May 13).
Staffs.—Mushroom Green Farm, Dudley Wood, Nr. Cradley Heath; Pleasant View, Drointon, Stow-by-Chartley, Stafford (May 11).
Suffolk.—Hill Farm, Gillingham, Beccles; Hall Farm, Undley, Lakenheath, Brandon; Crowfoot Farm, Sottenley, Beccles; Elms Farm, The Smere, Reydon, Southwold (May 11); The Maltings, Elmsett, Ipswich; View Farm, West Hall, Halesworth; Bull's Hall, Knodishall, Saxmundham (May 14).
Sussex.—Paythorn Farm, Fulking, Small Dole (May 13); 4, Rookery Lane, Rushlake Green, Heathfield (May 14).
Warwicks.—Boys' Pig Club, Lea Village, Birmingham, 26 (May 12); Green End Farm, Fillongley, Coventry; 16, Jean Street, Baddesley, Atherstone; 36, King's Road, Kingsheath, Birmingham (May 14).
Worcs.—Bunker's Hill, Benge Hill, Evesham; Yates Hay Farm, Malvern Link, Malvern (May 12); Blakebrook County Hospital, Kidderminster (May 14).
Yorks.—Summit House, North Dalton, Driffield; Low Baswick Farm, Leven Carrs, Leven, Hull; Sober Hill, Holme-on-Spalding Moor, York; Highfields, North Road, Royston, Barnsley (May 11); Grove Farm, Carlton Lane, Guiseley, Leeds; Hoyle Farm and Braithwaite Farm, Braithwaite, Keighley (May 13).

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LEGAL NOTES

Royal College Secures Another Conviction for Illegal Practice

Pleading guilty at Stoke-on-Trent on May 12th to six summonses for practising veterinary surgery without official registration, Joseph Fisher (45), Bottleslow Street, Hanley, was fined £1 in each case with £10 19s. costs.

Mr. V. A. McKnight (prosecuting for the Royal College of Veterinary Surgeons) said that Fisher claimed to have removed two pieces of bone from the internal organs of a sick spaniel. A veterinary surgeon later diagnosed enteritis and the dog soon recovered.

In another case, Mr. McKnight said, Fisher advised a month's rest for a spaniel with an injured hind leg. A veterinary surgeon found two severed tendons in the leg and the dog was successfully operated upon. In each case Fisher received fees for the treatment given by him.

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PRESS GUIDE TO BRITISH CHEMICALS AND THEIR MANUFACTURERS

Certain of our readers will find of service the book recently published by the Association of British Chemical Manufacturers entitled "Press Guide to British Chemicals and their Manufacturers" (pp. 76; March, 1953). Two thousand copies have been issued in the first instance to the national, provincial and technical Press (including scientific correspondents, editors of learned journals, etc.). The first 22 pages list the names and addresses of 126 chemical manufacturers, with the name and telephone number of an individual (often two names are given) who is authorised to supply information. A similar short section of two pages follows in which 13 chemical trade associations are listed, dealing with special sections of the chemical and closely allied industries. The third section, consisting of seven pages, is an alphabetical list of chemical products, each one being indexed to at least one code number that represents the firm handling the product. Finally comes the fourth section, 45 pages long, which contains a list of proprietary and trade names, and opposite each entry is the chemical name and the firm owning the copyright. Enquiries relating to this booklet should be addressed to the Association at 166, Piccadilly, London, W.1.

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THE SCOTTISH HIDE INSPECTION AND IMPROVEMENT FEDERATION

Mishandling of Bobby Calves Causing Substantial Leather Damage

Calfskin tanners have complained that in recent years there has been a progressive increase in the number of calfskins showing serious damage to the grain of the leather. The damage consists of scratches, scrapings and grain blotches. These faults cannot all be clearly seen when the calfskins are passing through the hide markets but all come to light in the finishing stages of tanning.

On investigating these complaints the Scottish Hide Inspection and Improvement Federation found the faults to be so widespread and the damage so serious that they organised a visit to Messrs. W. & J. Martin Limited's calfskin tannery of members of the Scottish Farmers' Union. The tanning of calfskins and lightweight hides suitable for upper leather was seen from the raw salted state to the finished material. The extent of the damage, and also that caused by warbles and goring, was then fully appreciated and conceded by the visitors. A few weeks earlier a similar visit was organised by the Federation for Slaughterhouse Superintendents and Slaughtering Supervisors.

It has been suggested that much of the damage is caused by rough handling and the use of sticks during transport to the markets or collecting centres and penning and possibly through further transportation in lorries to the slaughterhouses during which hoof scratch damage is most likely. With so much handling the Federation desires to emphasise to all concerned, that rough tumbling, prodding, using sticks and bumping in any way is most injurious to the tender skin of a bobby calf. A bobby calf has no layer of fat over flesh and bone to cushion rough handling.

Collecting centres and slaughterhouse personnel have promised to improve their handling practices. It is hoped that farmers will assist in the careful handling of calves from birth until they reach the collecting centres.

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Erratum.—"Blood Sampling Large Numbers of Cattle" (N. H. Hole) (*Vet. Rec.* **65.** 279): in the penultimate sentence, *for* "interdigital" *read* "interdental."

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

BLOOD SAMPLING CATTLE

Sir,—May I have space to refer to Mr. McDiarmid's letter in your issue of May 16th, and to congratulate him on his bleeding expertise. His speed of operation certainly outclasses mine, for although I have never gone for a record, I would not attempt, with one assistant to restrain and one to clerk, to take 5 c.c. of blood from each of 130 animals in an hour. It is quite easy to sample one animal in 30 seconds or less, but a very different matter to deal with 120 animals in 60 consecutive minutes. I would also like to know if transferring the blood from the syringe to the tube, and washing out the syringe, are included in the 27 seconds per animal.

Quite apart from the speed of operation, which is of very little importance, certain points on the sterility aspect appear to have been misunderstood. Firstly, the danger of setting up an infection in cattle by venepuncture, provided you use a reasonably clean needle, is practically non-existent, but this does not detract from the "impression value" of sterile individual outfits; we are dealing with owners of pedigree and often very valuable herds. Secondly, if a sterile sample is required, the act of transferring blood from syringe to tube, under cow byre conditions, is liable to result in a percentage of contaminations, even if a sterile syringe is used on each animal. With the "bleeding unit" technique the blood is never exposed to the air, passing

straight from the vein through a sterile needle into a sterile bottle.—Yours faithfully, N. H. Hole, Ministry of Agriculture, Weybridge.

* * * * *

ELECTRIC EUTHANASIA

Sir,—I was very interested in the observations of Messrs. Alexander and Boddie on electric stunning and euthanasia, and would like to comment on some of the points which they raised.

Size of sample.—I entirely agree that the sample is too small *and too uniform* to provide conclusive evidence; the expected range of a sample of 1,000 is 2·04 times as great as that of a sample of 11. However, observations of this type constitute an experiment within the meaning of the Cruelty to Animals Act of 1876, and therefore must be done by an operator holding the appropriate licence and certificate on premises approved by the Home Office. I have been willing to go anywhere in this country to extend the observations, but continuous search during the last two years has failed to reveal an opportunity for continuing the work on a larger assorted sample. I therefore thought it advisable to publish the results that were available, in the hope that others who were interested might be able to suggest ways and means for a more extensive trial. The original paper mentions that the sample will be increased as soon as an opportunity arises.

Restraint.—This is always a problem and I believe that the skill and attitude of the human being affects the dog as much as the method itself. Dogs resent walking on to the wet floor of a small dark box as well as being laid on their side on a blanketed table; the apparatus described in my paper does allow sick dogs to be destroyed almost undisturbed in their own baskets.

Electrodes.—Crocodile clips can be modified to increase comfort; the teeth can be filed, or a pad of lint soaked in saline can be interposed between the jaw of the clip and the skin.

Danger to the operator.—Electricity is always potentially dangerous; these observations, as explained in an earlier paragraph, are experiments and electrical experiments are usually carried out by scientists who have a working knowledge of current electricity. Serious electrical accidents commonly occur when a man tests a live wire with the flat of his hand or fingers, instead of the back. Muscular contraction may then cause him to grasp the wire and he is unable to release himself; such an accident could not occur if the bare arm above the glove made contact with a conductor.

I do not suggest that the apparatus described should be used by a layman with no knowledge of electricity. Safeguards, such as an insulating transformer in one of the leads, would have to be added if unqualified people were handling it; in Holland, practising veterinary surgeons have been using the apparatus with no additional safeguards and without gloves for a number of years, and owners have stroked their dogs without gloves during the process.

I do suggest, however, that those who are interested in the humane destruction of small animals, and those who have some knowledge of electricity, should collaborate to design an apparatus which electrocutes by passing current *through the brain* as well as the heart. The method described is not ideal; I hope its shortcomings may prompt others to devise something better, so that the doubts of the last 20 years can be finally dispelled, and everyone who wishes to electrocute an animal can do so with a clear conscience.—Yours faithfully, Phyllis G. Croft, Neuropsychiatric Research Centre, Whitchurch Hospital, Cardiff. *May 15th*, 1953.

. . . . .

Sir,—I have read the article "Electrocution of Small Animals" by Dr. Croft in your issue of April 25th and the subsequent criticism by Dr. Alexander and Dr. Boddie. May I relate the experience in Holland?

(1) *Affecting the animal.*—In 1928 Professor Kok carried out the first experiments in Holland for the electrocution of small animals; nowadays many practitioners are using it. In the beginning the method of using a copper necklace was employed, but experiments showed, as Dr. Croft indicates, that the brain must be in the circuit to be sure the animal is stunned before death. Now there is used a crocodile clip on a wettened ear or lip; that causes *no* struggling and there is sufficient contact. It has been practised, without failure, in many hundreds of dogs and about 40 cats. There is a large variation in resistance, but if one uses a meter for amperage one can see that after clipping the hair if necessary and wetting with plain water, there is always an amperage of 100 mA or more. So some variation is possible (130V. is enough: even 80V. in ideal circumstances), but overdosing ensures safety. To lay the dog on the table is not necessary; one can do it in his basket or on the floor, even standing, but should it fall down there is the risk of pulling off the electrodes. Specially in a little dog, it is easy to hold the dog with artery forceps while the current goes through, then no sensation of pain is possible.

(2) *Affecting the operator.*—If Dr. Alexander and Dr. Boddie make the experiment of touching a dog with the current turned on, they will be astonished in that they feel nothing, for the current goes the way of least resistance, that is, through the body and not along the skin, while here the resistance is the highest. The same conclusion was arrived at during the electrical stunning of cows. It is possible to touch them. But I quite agree one must not take the chance, for it is safer not to touch the dog (one may have wet hands or the floor may be wet). No one in Holland wears rubber gloves and from hundreds of cases no accident has been reported. If one is anxious, then it can be done in a box, by closing doors that switch the current on by pressure buttons. Many of these are in use in Holland; they also are recommended by the Dutch S.P.C.A. In Holland we are sure that, on scientific grounds, Dr. Croft's principles are correct, but the possibility of making apparatus for practical application and specially when it must be handled by laymen, has to be discussed.—Yours faithfully, E. J. Youte, Amersfoort, Holland. *May 14th*, 1953.

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THE PRACTITIONER AND HIS DRUGS

Sir,—The letter of your correspondent W. K. Rose (*V.R.* dated May 9th) does not surprise me as a pharmacist. It is characteristic of the attitude that frequently exists between the veterinary and pharmaceutical professions.

In his attitude to the proposals to form an association of veterinary pharmacists, your correspondent reminds me of political opponents who put into the mouths of the other fellows words they did not use and then proceed to tear those words to pieces. In my opinion, the first three purposes of the proposed association should meet with the approval of veterinary surgeons, as it is quite clear that they are framed in the interests of animal husbandry. What your correspondent thinks these words mean I do not know. But to those of us who helped draw them up they mean exactly as they say. Surely, Sir, is it not better for the pharmacist who is likely to be consulted on veterinary matters to try to be knowledgeable enough to be able to advise his clients when to seek the proper advice of a veterinary surgeon, than to force him into the ranks of the pedlars of quack animal medicine? I would point out that similar ill-feeling existed years ago between the medical and pharmaceutical professions, but to the benefit of all, the doctors had the sense to recognise the place of the pharmacist. I am pleased to say that a better feeling is coming into being among younger veterinary surgeons. They are now, I understand, taught in your colleges the art of writing prescriptions and encouraged to have these dispensed by a pharmacist.

Put into plain words, Sir, what your correspondent wants to say is that the veterinary surgeon should not only diagnose and give treatment, but that he should be given the monopoly of supplying medicines for animal use. It is here that confusion really lies, because your correspondent knows full well that it is his own economy and not agricultural economy he is concerned with here. The pharmaceutical profession have always recognised that it is the business of the veterinary profession to diagnose and administer treatments, and to supply drugs for immediate treatment. But by and large the veterinary surgeon ignores the fact that by his five years' training, by law and by every other body in the land, the pharmacist is acknowledged to be the right and proper person to dispense and supply drugs. It is not to be wondered at, therefore, that antagonism exists between our two professions, and I can see no great improvement coming until the veterinary surgeon can economically divorce his professional work from the purely commercial part it includes to-day. The simple fact is, Sir, that as things stand at the moment, the veterinary surgeon who supplies drugs in bulk for the farmers' use is just as much keeping open shop as any retail pharmacist, and as such should not grumble if he meets competition from the pharmacist.

The object of this letter is not to stir up more controversy between our two professions, but rather that we can get to know each other's views and so start to operate the second of the two purposes we had in mind when proposing an association of veterinary pharmacists.—Yours faithfully, J. S. Horridge, M.P.S., Tarporley, Cheshire. *May 18th*, 1953.